DOMESTIC ENGINEERING

VOL. 23. NO. 6. Chicago SEPTEMBER TWENTY-FIFTH, NINETEEN HUNDRED AND TWO New York WHOLE NO. 155

NEW YORK, BOSTON, MINNEAPOLIS, DENVER PHILADELPHIA, ST. LOUIS, LONDON, HAMBURG **AMERICAN RADIATOR CO.** GENERAL OFFICES LAKE & DEARBORN STS. CHICAGO.

Our Patent Rubber Joint
Basin and Bath Cock Couplings

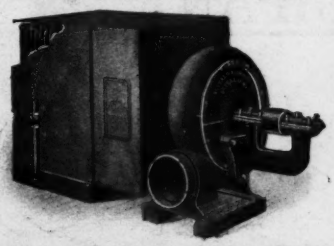
Can be used on any and all makes of cocks. Use your old nuts and buy the Rubber Joint Fittings from us. They are made in one piece. No soldered joints to split or leak. They are the greatest labor and money savers ever produced.
GIVE THEM A TRIAL

Glauber Brass Mfg. Co.
CLEVELAND, OHIO
INFRINGEMENTS WILL BE PROSECUTED.

PATTERNS
GOBEILLE PATTERN CO. Cleveland, O.

BUFFALO FAN SYSTEM

HEATING AND VENTILATING
AIR VOLUME POSITIVE AND UNIFORM AND UNDER COMPLETE CONTROL



Installed in All the Leading Schools, Churches, Factories, Public and Industrial Buildings, Railroad Machine & Repair Shops, Round Houses, Etc.

BUFFALO FORGE CO.
BUFFALO, N. Y., U.S.A.

CROSBY SPRING-SEAT GLOBE and ANGLE VALVES
All Parts Interchangeable
All Parts Renewable
Tested for Highest Pressures
LEAK-PROOF CROSBY STEAM GAGE AND VALVE CO. Boston New York. Chicago

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See our Advertisement....Page 251

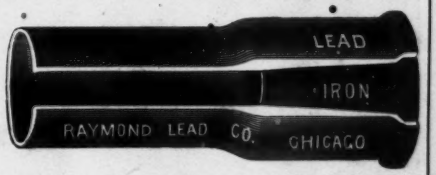
SEE ADV. ON PAGE XLIII.

PARAGON BOILER
ISAAC A. SHEPPARD & CO., - PHILADELPHIA

WHAT A DIFFERENCE
In the quality of Plumbing work.

RAYMOND'S

COMBINATION FERRULES MAKE RELIABLE CONNECTIONS BETWEEN LEAD AND IRON PIPES.



WHY?

Because they have an extra thickness of lead over the shoulder, giving strength where it is needed, and where other Lead Ferrules are weak.

The genuine article bears our label.

RAYMOND LEAD COMPANY, CHICAGO.

JENKINS BROS.' VALVES
are manufactured of the best steam metal, and are fully guaranteed. Why experiment with cheap valves? If you want the **BEST** ask your dealer for valves manufactured by Jenkins Brothers. Remember all genuine are stamped with our Trade Mark.
JENKINS BROS., New York, Philadelphia, Chicago, Boston

Constructed under the Jewell Warren Continental & Hyatt Patents
GRAVITY AND PRESSURE FILTERS
WRITE FOR CATALOGUE
SOFT PURE WATER GUARANTEED
By our scientific methods. Increases boiler efficiency—No scale.
Reduces fuel and repair bills.
New York Continental Jewell Filtration Co.
40-42 W. Quincy St., CHICAGO. 15 Broad St., NEW YORK.

F. E. Cudell's PATENT sewer gas and back-water **trap**

for wash bowls, sinks, bath and wash tubs

Put into the White House by the U. S. government. For venting use vent trap.

CLEVELAND, OHIO

AUDITORIUM LIGHTING
is a specialty in itself. We have been making a success of it for nearly half a century. Send data for estimates. Special designs on request.
I. P. FRINK, 551 Pearl St., NEW YORK

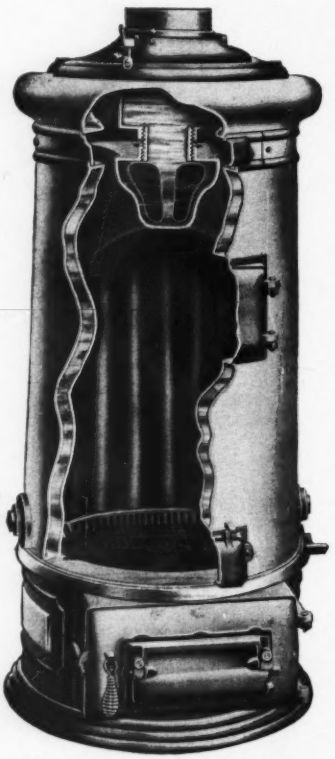
The Pattern Shop of the East
H. B. OLMSTEAD CO.
87 FRANKFORT ST., NEW YORK

FOR 25 YEARS The World Has Known the Excellence of Crosby Steam Gage & Valve Co. Appliances. None so Efficient and Durable. Design and Workmanship Unrivaled **CROSBY** STEAM GAGE & VALVE CO. BOSTON. NEW YORK. CHICAGO.

BEARDSLEE CHANDELIER MFG CO. 254 AND 256 SIXTH AVE. CHICAGO
GAS & ELECTRIC FIXTURES FOR THE TRADE.
CATALOG SENT PREPAID TO DEALERS MENTION THIS PAPER

Cleveland Cocks Best steam metal. Easily reversible. Tested at 200 lbs. pressure. . . . The Central Brass Mfg. Co., Cleveland, O

Our New Ideal Premier Tank Heater



Ideal Premier Tank Heater.

is now ready for the market, and we invite your critical examination of its various features of construction.

Send for our new Complete Catalogues of
Ideal Boilers
and
American Radiators.

AMERICAN RADIATOR COMPANY

Lake and Dearborn Streets

CHICAGO

NEW YORK
BUFFALO
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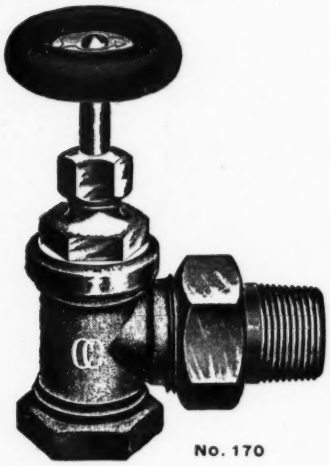
CRANE RADIATOR VALVES



No. 170

THE FEATURES OF OUR

QUICK-OPENING VALVE

FOR HOT WATER ARE:

1. IT OPENS AND CLOSES WITH A HALF TURN.
2. THE FULL AREA OF THE PIPE IS MAINTAINED.
3. THE BY-PASS IN THE DISC INSURES CONTINUOUS CIRCULATION WHEN VALVE IS CLOSED, THEREBY PREVENTING FREEZING.
4. IT MAY BE PACKED AT ANY TIME WHILE WATER IS IN THE SYSTEM.
5. THERE IS NO SPRING USED, AND NOTHING TO GET OUT OF ORDER.

JUST THE THING FOR RESIDENCES, APARTMENT AND OFFICE BUILDINGS.

WRITE FOR POCKET CATALOGUE.

NEW YORK
PHILADELPHIA
CINCINNATI
KANSAS CITY
SIOUX CITY
DULUTH
OMAHA

CRANE CO.
CHICAGO
ESTABLISHED 1855

ST. PAUL
ST. LOUIS
SEATTLE
MINNEAPOLIS
LOS ANGELES
SAN FRANCISCO
SALT LAKE CITY
PORTLAND, ORE.

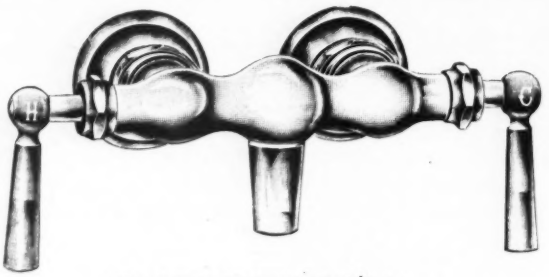
Radiator Valves

Union Elbows

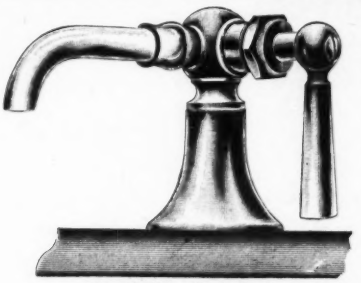
As indicated by photo illustrations, our valves have beauty as well as strength, as a result of judicious distribution of metal

Western Tube Co.
Kewanee, Illinois

The "S & K" Nickel Plated No. 4¼ Fuller Combination Bath Cock



No. 4¼ Fuller Combination Bath Cock.



No. 0½ Fuller Basin Cock.

THE "S & K" NICKEL PLATED No. 0½ FULLER BASIN COCK

Especially adapted for use in Hotels, Public Buildings, Barber Shops, etc. No sharp corners to show brass and easily kept bright. Special prices to the trade.

STREET & KENT MFG. COMPANY — SOLE MANUFACTURERS — CHICAGO, ILL.

STREET & KENT MANUFACTURING CO.

MANUFACTURERS OF PLUMBERS' BRASS WORK

New York Office, 81 Fulton Street. 43-45 Fulton Street, Chicago, Ill.

The Henderson

The finest sectional heater made. Our catalogue does not consist of cuts and price lists alone. It tells all about the heater in a way that enables you to understand its construction.

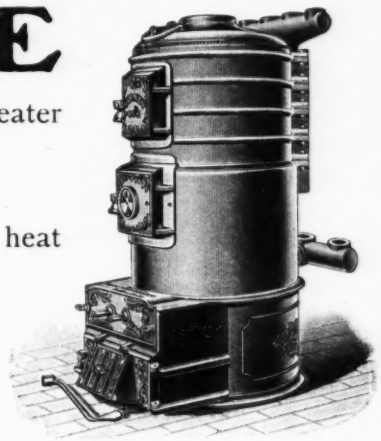
The Prizer-Painter Stove and Heater Co.

Reading, Pa.

NEW YORK 160 5th Ave. BOSTON 75 Pearl St. DETROIT 380 Cambell Ave.

ST. PAUL 19 Gilfillan Block MILWAUKEE 699 Hackett Ave.

ALL INCLUSIVE



You'r in a position to know what people demand in heater construction. Do they seek economy in operation?

You Have It In "Gurney" Heaters.

Do they seek exceptional efficiency,—the greatest heat from the fuel consumed?

"Gurney" Heaters are Famous in that Respect.

Do they seek durability, that feature which actually reduces cost of the heater?

"Gurney" Heaters Wear Longer Than Others.

Add to all this the fact that "Gurney" Heaters are simple in construction, easy to operate and no more expensive than many inferior makes, and you know why they prove the strongest trade attractions.

Capacities fully guaranteed. Write us about an agency. At the same time we'll send latest catalogue.

Gurney Heater Mfg. Co.

74 Franklin St., BOSTON.
111 Fifth Ave., NEW YORK CITY.
Western Selling Agents James B. Clow & Sons, Franklin and Harrison Streets, Chicago.

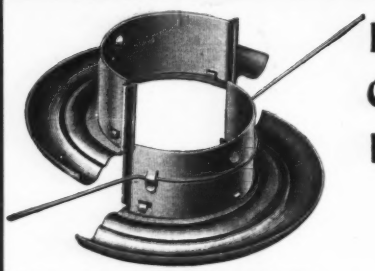
Willing Workers—

that's the kind. Work 365 days in the year—no holidays; no strikes; no "off" days. There are no more reliable closets than the Trenton Potteries Company's. Their working qualities are guaranteed. : : : : : : : : : : : :

The closet here illustrated is as fine a working fixture as was ever turned out of any pottery. Has 3-inch seal against sewer gas. Extra large water surface in bowl. Large openings through traps. Roughs in 8¾ inches to end of tail piece, or 12 inches with lowdown tank. 1¼ inch supply for high tank; 2 in. for low tank. Positive action.

SYPHON ACTION HOPPER AND TRAP.
No. 21 (Fig. 307 B).

THE TRENTON POTTERIES CO., TRENTON, N. J.



Patented Nov. 3d, 1896, June 14th, 1898

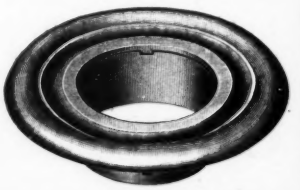
H. B. Perfection Ceiling Plate

Never Falls Down

Other plates are very good plates, but the H. B. Plates are better. They snap up and stay up. Don't forget, They snap up against the ceiling instead of on the pipe.

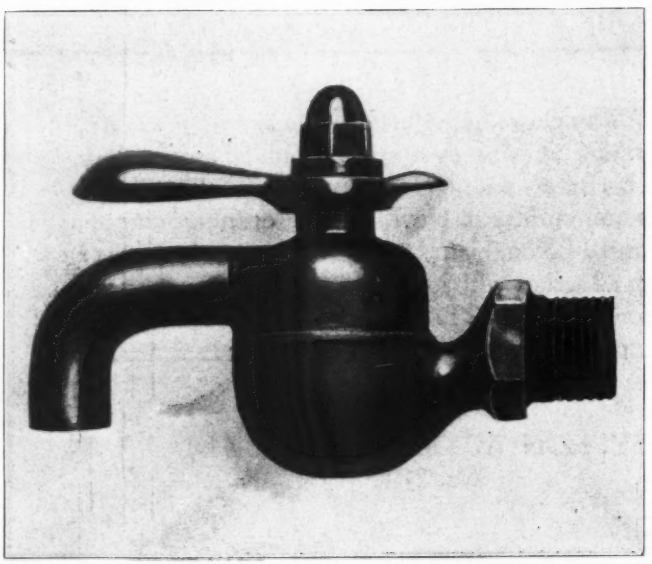
HOUGHTON & BUXTON MANUFACTURING COMPANY
WORCESTER, MASS.

H. B. Perfection Floor Plate



Holds The Drip

NO PACKING



YOUV'E BEEN LOOKING FOR IT FOR YEARS

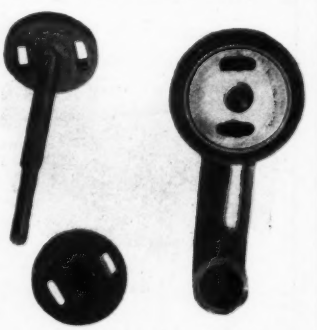
We Have It

Basin Cocks, Bibbs, Sill Cocks, Bath Cocks, Ball Cocks,

ABSOLUTELY WITHOUT PACKING

No hammering or pounding of pipes. Works equally well on high or low pressures.

Parts of No. 1 Bibb.



Showing Valve, and Valve with Stem attached, also hole in center of Faucet, which is a water tight chamber through which the Stem passes to turn the Valve. This Stem is so attached to the lower seat as to allow it to adjust itself to the upper one.

The water flows around the Stem Chamber to the Spout, and as this chamber is water tight there is no packing required.

The Syracuse Faucet and Valve Co., 1618-22 North Salina Street, Syracuse, N.Y.

WHERE THE PURITUS IS INSTALLED.

"The Puritus" Closet Ventilator

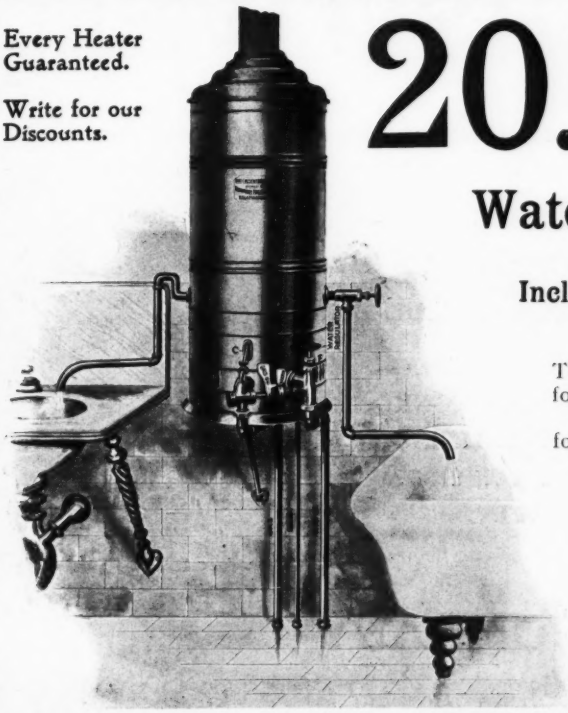
List Price $15.00

PATENTED

THE W. J. SCULLY VENTILATOR CO.
DETROIT, MICH. U.S.A.
50 COLBORNE ST. - TORONTO. ONT.

Every Heater Guaranteed.

Write for our Discounts.



20.00 is the price of the No. 8 Crescent Instantaneous Water Heater, Nickel Plated,

Including Nickel Plated Shelf and Bracket.

The greatest value in the water heater line ever offered for the money. We make all shipments "rush shipments." If you have not received our new catalogue, send for it immediately. It contains full and up-to-date information of the most perfect line of Instantaneous Water Heaters ever offered to the trade.

HUMPHREY MFG. & PLATING CO.

Kalamazoo, Mich., U. S. A.

Patented December 9, 1880. February 2, 1892. June 14, 1892. Other patents pending.

Price, $1.35 each.

THIS EXPERIMENTING
WITH CHEAP VALVES IS COSTLY BUSINESS.

THEN WHY TAKE CHANCES WHEN

Perfected-Duplex No. 6

Locked Shield Automatic Air Valve

THAT HIGH GRADE VALVE IS GUARANTEED FOR FIVE YEARS.
IN USE OVER TEN YEARS.

Monash-Younker Co.

LARGEST AIR VALVE MAKERS IN THE WORLD

CHICAGO NEW YORK

BE INQUISITIVE

INVESTIGATE EXAMINE CONSIDER

You have a right to know what you are buying—poor goods upset the best laid plans and are expensive. The best in the end is the cheapest

THE IDEAL MFG. CO. DETROIT MICH.

The Ideal Low Tank Combination

stands the most rigid inspection—inside and out.

THE FINISH OF THE WOODWORK; THE CONSTRUCTION OF THE SEAT; THE STYLE OF THE TANK; THE BALL COCK; THE FLUSH VALVE; THE LINING, IN FACT EVERYTHING ABOUT AN *IDEAL LOW DOWN* BESPEAKS WORKMANSHIP AND INGENUITY.

CORRESPONDENCE SOLICITED

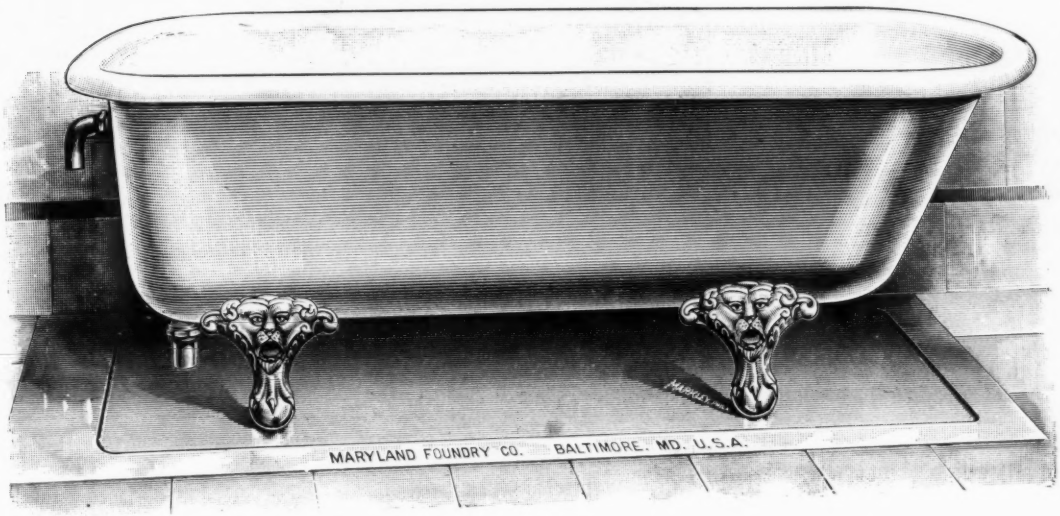
THE IDEAL MFG. COMPANY

DETROIT, MICHIGAN

NOT IN THE TRUST

PRINCESS PORCELAIN ENAMELED BATHS

3 INCH ROLL RIMS



Nothing but the very finest of materials are used in the manufacture of these Baths. The iron is of the best quality and enamel is the purest, strongest and most durable that can be produced. Our prices are interesting.

A. WEISKITTEL & SON, BALTIMORE, MD.

MANUFACTURERS OF IRON ENAMELED BATH TUBS, LAVATORIES, SINKS, AND PLUMBERS' BRASS GOODS

Our New "Excelsior" Waste and Basin

PATENT APPLIED FOR

Fig. E 501.

We make the above Waste to fit the P. O. Bowls also.

THE MOST SANITARY COMBINATION ON THE MARKET.

This Waste cannot get out of order as will be readily seen. **We guarantee them in every respect.**

The Basin is the only one that can be cleaned **without removing a brass strainer.**

This Basin has no strainer, still only the dirty water can pass into the overflow, which is made in such a manner as to make it easily accessible Our new Catalog E tells you all. Have you one?

THE SANITARY COMPANY

CLEVELAND, OHIO

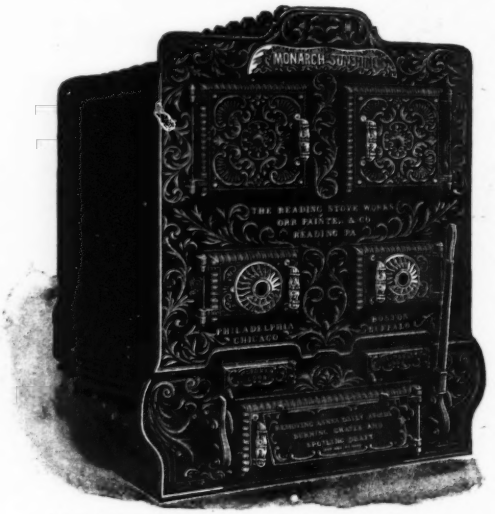
The Monarch Sunshine Heaters

The Monarch Sunshine Heaters have the largest fire surface.

That means saving in fuel.

They are easily handled and set.

That means saving in labor.



MONARCH SUNSHINE WATER HEATER, 825 to 6700 ft.

They are rated very conservatively.

That means plenty of heat in coldest weather and satisfaction to all concerned.

BOSTON,
86-88 Canal Street.

PHILADELPHIA,
64-66 N. 2nd Street.

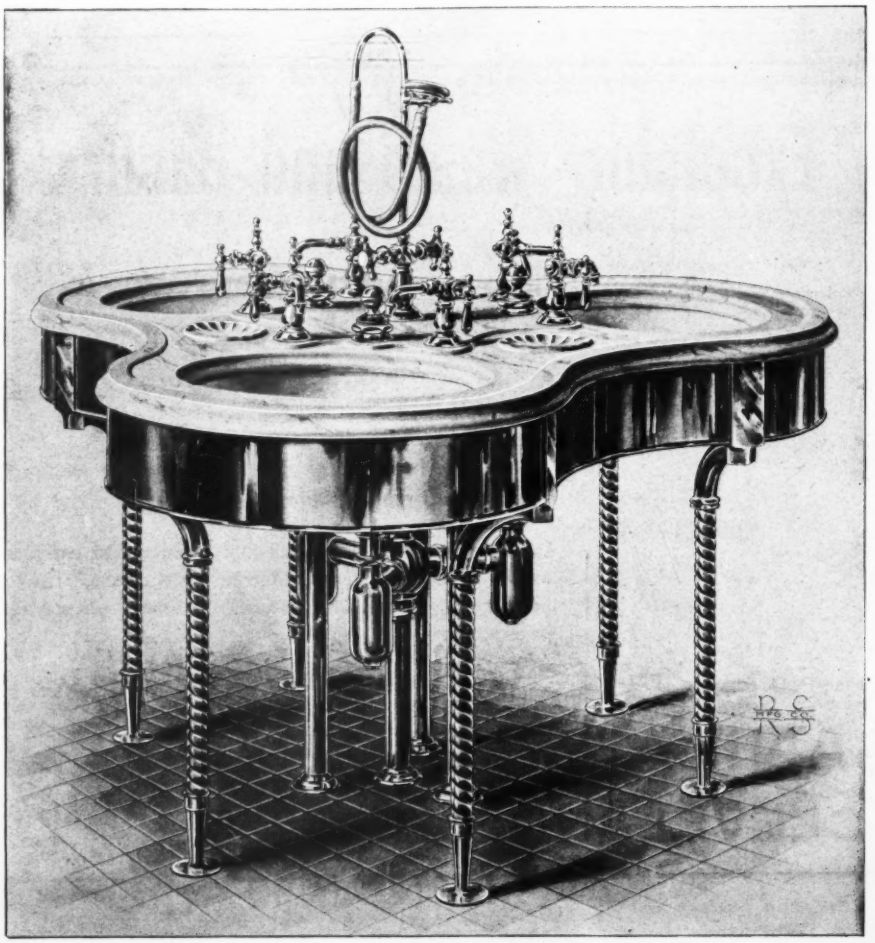
READING STOVE WORKS

ORR, PAINTER & CO.

READING, PA.

BUFFALO,
411 William Street.

CHICAGO,
153-5 S. Jefferson St.



Barber's Lavatory

"Clover Leaf" Pattern

One of the many novel designs made by

Rundle-Spence Mfg. Co.

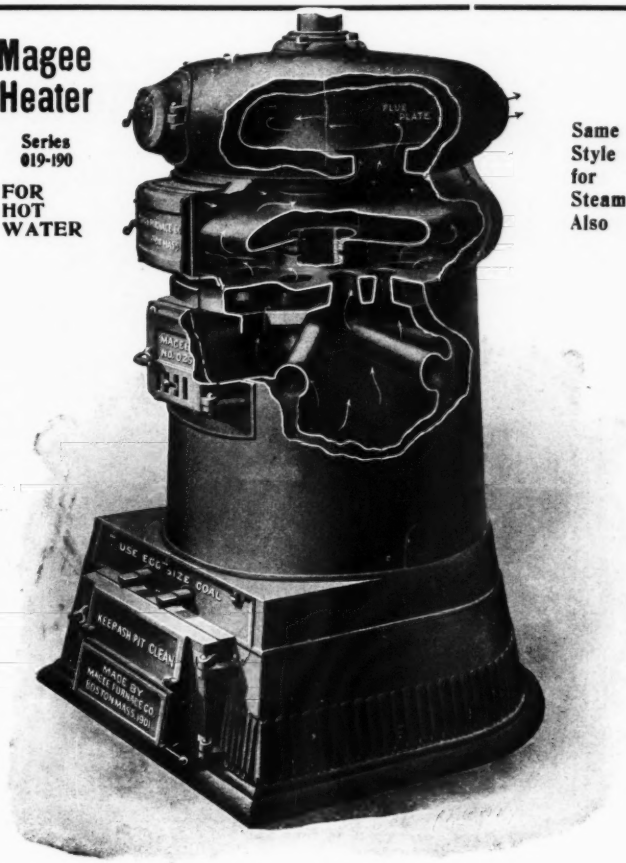
Milwaukee, Wis.

CHICAGO OFFICE
52 Dearborn Street

Magee Heater

Series 019-190

FOR HOT WATER



Same Style for Steam Also

Note flue capacity—indirect. No local circulation in this heater—impossible.

See also extraordinarily large amount direct fire surface.

Capacities: 600 to 1800 sq. ft. in Hot Water Heaters; 350 to 1100 sq. ft. in Steam Heaters

FIVE SIZES OF EACH

Magee Furnace Co.

32-38 Union Street, Boston

Western Agency

J. D. LOTT & CO., 86 Lake Street Chicago

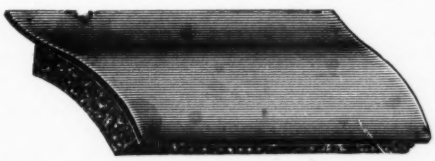
Steam and Hot Water Heaters, Warm Air Furnaces, Combination Warm Air and Hot Water,—Ranges—Stoves—etc.

Largest Line under One Name in the United States.

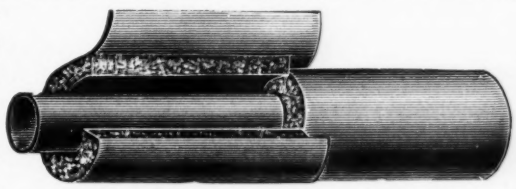
ROCK WOOL PIPE COVERINGS

Are absolutely the best coverings made.

These coverings received the Centennial award for "Indestructibility and for their value as non-conducting material for protection against fire and prevention of radiation of heat." Rock Wool pipe coverings last longer than other coverings and give better satisfaction.



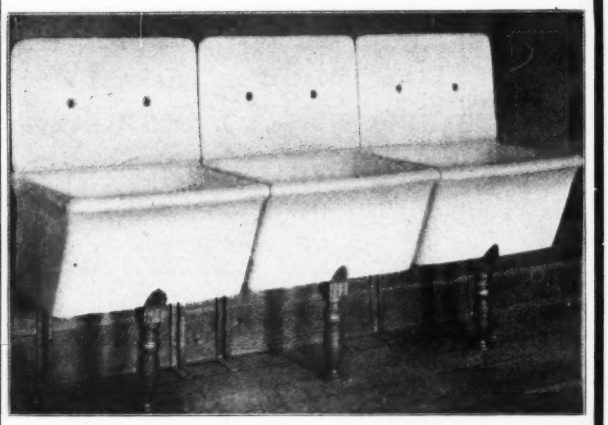
The wool in these coverings will not settle to the bottom of the pipe, not even under the severest vibrations in factories etc. They are soft and yielding to the expansion of hot pipes, will not burn, crack nor wear out.



We also make a line of Boiler Blocks to fit any boiler. Write for discounts to the trade.

BATAVIA MINERAL WOOL CO.

BATAVIA, N. Y.



Solid Porcelain Laundry Tubs

Made by the

American Porcelain Company

NEW BRIGHTON, PA.

Makers of the well known "Perfection" solid porcelain flat and roll-rim laundry tubs, kitchen and pantry sinks, lavatories, etc.

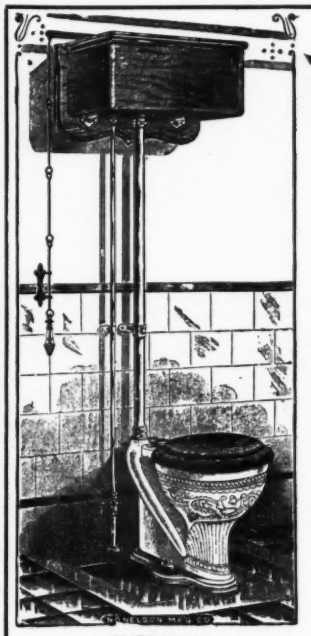


PLATE 315 C

Nelson's

High Grade Syphon Jets.

The New "Dominion"

Double Jet
Polished Wood Work
Mechanically Perfect
Absolutely Guaranteed

N. O. Nelson Mfg. Co.

...PLUMBERS' SUPPLIES...

ST. LOUIS, MO.

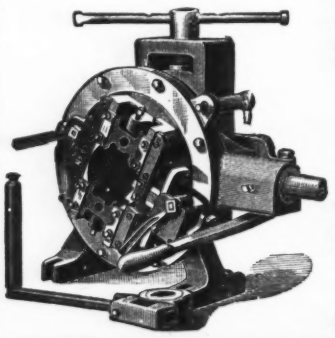
MINUTES COUNT

When you have a "Rush" Job on hand 'tis then the virtues of

ARMSTRONG'S

WATER, STEAM AND GAS FITTERS TOOLS

make themselves apparent.



They are made especially for Time and Labor—Saving and for Extensive Wear.

ARMSTRONG GENUINE PIPE THREADING and CUTTING OFF MACHINES HAND or POWER capacity from 1-4 in. to 6 in.

PIPE WRENCHES VISES ADJUSTABLE STOCKS and DIES

Send for Catalogue

THE ARMSTRONG MFG CO

BRIDGEPORT, CONN., U.S.A.

NEW YORK 139 CENTRE ST.

T.P.A.A. 163

A Shower and Vapor Bath in One

At ½ the price of the former.

Read what others think of it:

Scranton, Pa., April 25, 1902.

VAPOR SHOWER BATH CO.

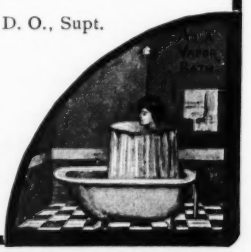
Gentlemen:—The combination Vapor and Shower baths which we procured from you some time ago have been put to varied and almost constant use since their arrival and have proved satisfactory in every respect.

As soon as we increase our bathing facilities, we will probably order more, for the best is none too good for the Green Ridge Sanitarium.

Very truly yours

Herb't I. Furman, D. O., Supt.

Correspondence Invited



Vapor Shower Bath Co.

632 Granite Bldg., Rochester, N.Y.
Berlin, Ontario.

GEM Hot Water and Steam BOILERS

EASILY AND QUICKLY SET UP
CAPACITY GUARANTEED

WE ALSO MAKE THE

ABENDROTH VERTICAL SECTIONAL STEAM AND WATER BOILERS

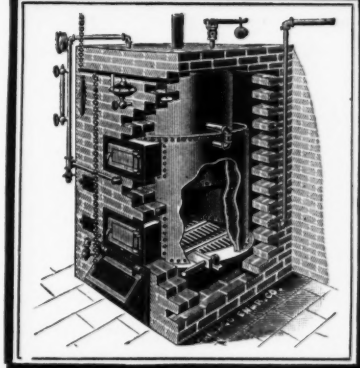
LONG AND FAVORABLY KNOWN TO THE TRADE EVERYWHERE

Write for Illustrated Catalogue

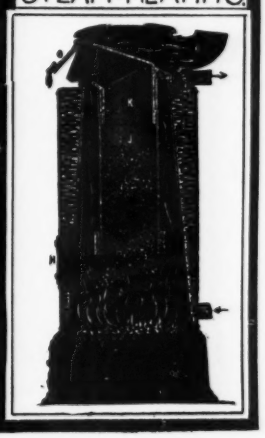
ABENDROTH BROS. 109-111 Beekman St., New York
114 High St., Boston, Mass.
Pt. Chester, W. Chester Co., N.Y.

AGENTS: Crane Co., Philadelphia, Pa. Western Valve Co., Chicago, Ill.

KEWANEE BOILER COMPANY
KEWANEE ILL.



MANUFACTURERS OF
HAXTUN STEEL BOILERS FOR HOT WATER AND STEAM HEATING



"TABASCO" WATER HEATERS
ALL STEEL
SELF FEEDERS

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169 LAKE ST.
·CHICAGO·

INTELLIGENT ECONOMY

forbids the purchase of three pumps when you can get ONE that will do the work of three.

THE PERKES

COMBINATION AIR, FORCE AND TEST PUMP

can be used for testing soil pipe, proving gas pipe, and is the best force pump on the market.

No stuffing boxes; all valves are on the outside, and work equally well with air or water.

PATENTED MARCH 18TH, 1898
PATENTED JUNE 18TH, 1901

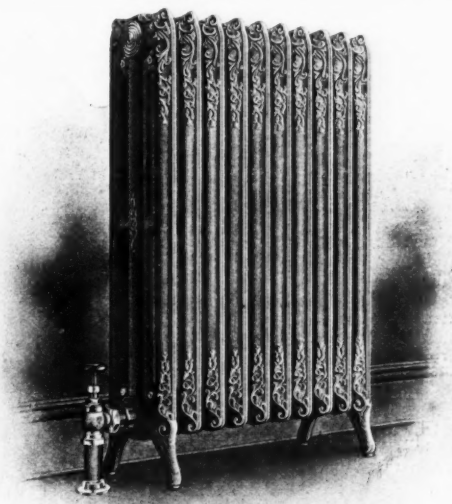
Send for Complete, Descriptive Circular.

MANUFACTURED BY

CHARLES PERKES

ESTABLISHED 1856

627-629 Arch Street, Philadelphia



We tell the story in one brief sentence, viz:

Our product is the very best that can be produced, and at prices no higher than you pay for an inferior product. Prices and catalog will be mailed on application.

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SUCCESSOR TO
The Fowler Radiator & Mfg. Company, Johnstown, Pa.

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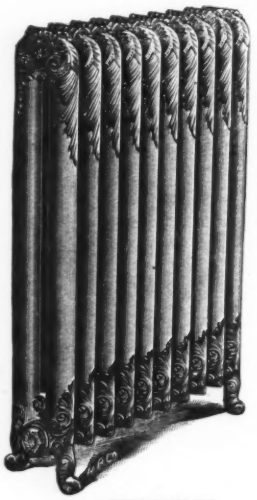

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Manufactured in all heights for Steam and Hot Water. A complete line of Two Column, Three Column and Window Radiators.

A postal card will bring you descriptive matter and prices.

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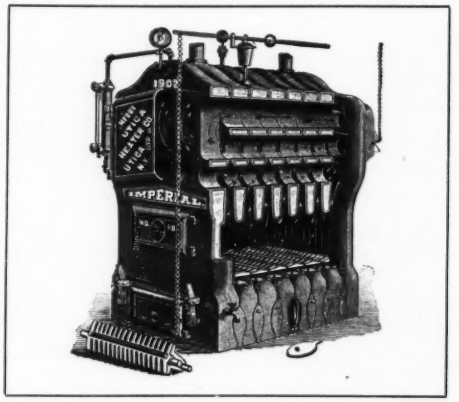

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IMPERIAL STEAM HOT WATER

They have immense actual fire surface, are conservatively rated, give perfect satisfaction, and

THE PRICE IS RIGHT

Send for Exclusive Agency today.

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Water Softening and Purifying Apparatus

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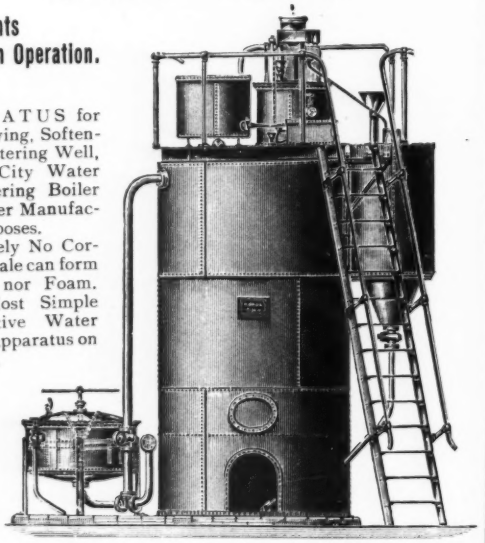
System "BREDA"

5,000 Plants in Operation.



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Absolutely No Corrosion or Scale can form in Boilers nor Foam.

The Most Simple yet Effective Water Purifying Apparatus on the market.

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We Guarantee Results or Remove Apparatus Free of Charge.

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The New York Radiator

New York Three Column

The Latest and Most Improved

Artistic Design

Full, Efficient Surface

All Heights

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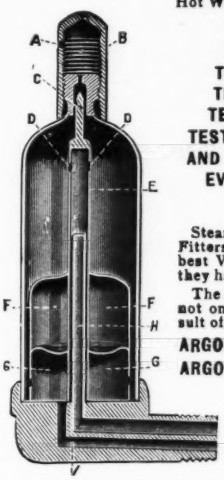
STANDS ALL TESTS

IN ORDER TO OBTAIN THE BEST RESULTS
IN RADIATION IT IS NECESSARY TO USE

The Argon Automatic Air Valve

It is the only one on the market equally efficient on both Steam and Hot Water Radiators.



TESTED FOR AIR
TESTED FOR GAS
TESTED FOR STEAM
TESTED FOR WATER
TESTED FOR SERVICE
TESTED FOR PERFECTION
AND NOT FOUND WANTING
EVERY ORDER BRINGS
ITS DUPLICATE

Steam Heaters, Contractors and Fitters are not acquainted with the best Valve on the market, unless they have tried the ARGON.

The decision of experts, evinced not only in opinion, but as the result of experience, is that the

ARGON VALVES DO THE WORK
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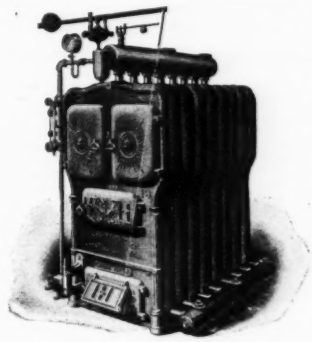
Need No Adjustment Are Guaranteed

INTERIOR VIEW. EXTERIOR VIEW

The Argon Manufacturing Company

DENVER, COLORADO.

"THATCHER"



Steam and Hot Water Heaters are the result of 52 years successful experience in making High Grade Heating Apparatus. These Boilers have a greater and more effective heating surface in proportion to gate surface than any other boiler on the market. They are easily sold because of their superior construction and established reputation. Styles and Sizes to meet all requirements. Prompt Shipments.

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Works: Newark, N. J.

Payne Frost-Proof Closet

The only Complete frost-proof combination now on the market

Requires No Ground Box.

Can be repaired and flush regulated from above the floor.

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Can be removed without digging up.

Only One Movable Part.
No Weights. No Levers.
No Chains. No Pins.

We guarantee this Combination to be a perfect and complete fixture, made in two, three, four and five foot lengths to suit the trade, with or without tank.

Pittsburgh Brass Mfg. Co.

Manufacturers

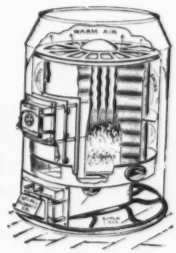
107 Wood Street Pittsburgh, Pa.

Write for descriptive circular and price list.

DO YOU KNOW ALL ABOUT THE BEST HOUSE-HEATING APPARATUS?

THE PRINCIPLE OF

THE KELSEY WARM AIR GENERATOR



Is to warm great volumes of air by bringing it into ACTUAL CONTACT with an EXTENSIVE and PROPERLY HEATED surface.

Each section has eight square feet of heating surface, and weighs about seventy pounds. There are from nine to seventeen sections in each generator, according to its sizes. This means a powerful and economical heater, and an abundance of pure warm air. Each section is an independent heat generator, and by capping over one or more, and extending a heat-conducting pipe therefrom, the warm air is forced through long or level pipes to the rooms so connected.

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KELSEY HEATING CO.

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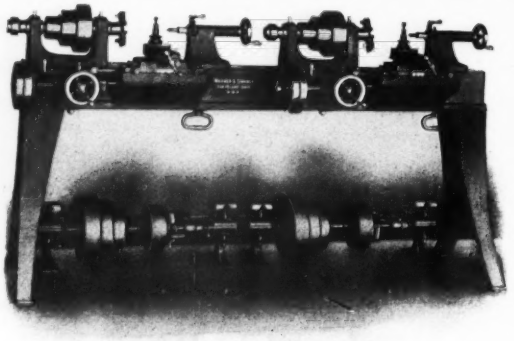
THERE'S ONLY ONE "WARM AIR GENERATOR," THE KELSEY, AND IT IS PATENTED

COMPLETE LINE OF
Turret Lathes AND Screw Machines
BRASS WORKING MACHINERY



DOUBLE HEAD KEY LATHE
For turning Keys for Steam, Water and Gas Cocks.

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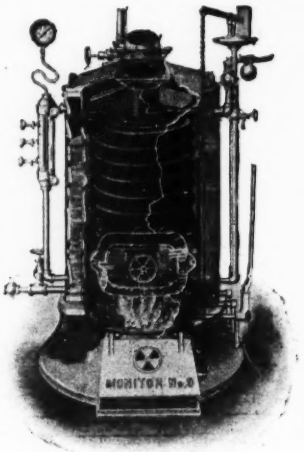
"USING LESS COAL

THAN I EVER DID AND AM GETTING MORE HEAT."



Such expressions as this abound in letters from buyers of

Monitor Steam and Hot Water Boilers.

Every contract includes a guarantee of workmanship and material.

Many details of interest to dealers in search of profit are contained in our catalogue.

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THE LIGHT THAT NEVER FAILED

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The best illuminant known —can be made by the

Nueralite Generator

At a smaller cost than any other light can be procured.

THIS Generator is simple, is guaranteed to be absolutely safe. It is approved by the National Board of Fire Insurance Underwriters and received the highest award at the Paris Exposition in 1900. It is entirely automatic in action—wonderful in its simplicity and economy. It is very generously rated as to the number of lights sustained. Comparsion with any other gas machine will quickly show the superior merit of the Nueralite. It is especially adapted to country houses, seaside villas, clubs, etc. Write us for full information and descriptive booklet.

Nueralite Gas Machine Co.
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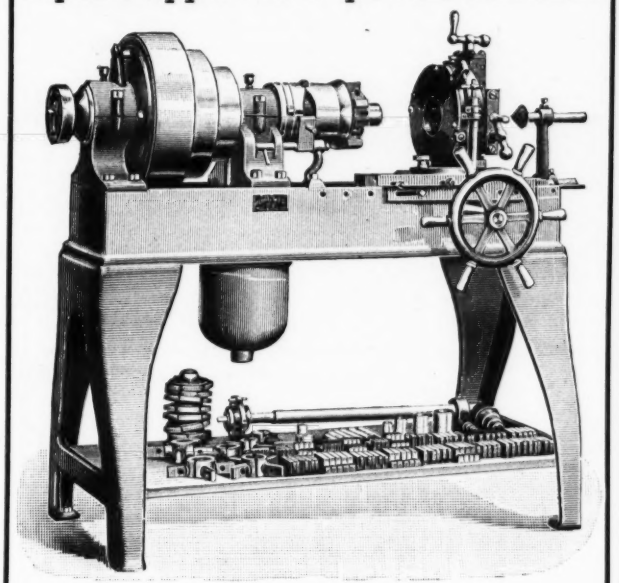
Apex Nipple and Pipe Mill Machine



Will thread nipples thread to thread all sizes within range of machine.
Equipped with our Standard Adjustable Quick Opening and Closing Dies, allowing cutting off of pipe close to grippers.
Nipple grips can be closed on threaded end of pipe without injuring thread.
Only machine on the market with this feature.
Write for catalogue and prices.

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208 Curtis Street, Toledo, O., U. S. A.

The Standard Sanitary Pottery Company

Works: 1122 Elizabeth Ave., Elizabeth, N. J.

MANUFACTURERS OF

Vitrified Bone China

Sanitary Specialties

We beg to call your attention to our High Grade Sanitary Earthenware, manufactured from Vitrified Bone China. Employing none but experienced and competent workmen, we are in position to manufacture all classes of Sanitary Specialties, and we solicit correspondence from those in the trade having anything in this line which they desire made.

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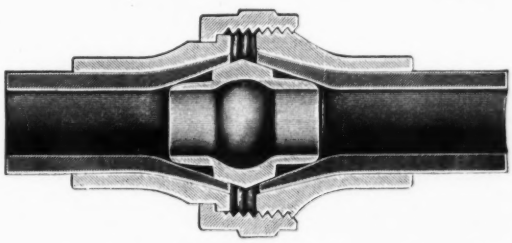
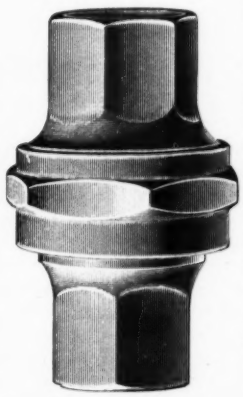


The Anderson Lead Pipe Coupling



For connecting all sizes of lead pipe, and lead to iron pipe.

Fulfills every requirement of a lead pipe coupling with perfect satisfaction. Supplies a long needed improvement. In connecting two lead pipes, these couplings make a combination of union and joint. They are easily and quickly adjusted and can be coupled and uncoupled again when necessary. The advantage of these couplings for lead to iron pipe, is the combination of union, joint and nipple, making them preferable to all other couplings in use

The Anderson coupling is supplied in the rough, brass finished or nickel plated and is the neatest, cheapest, strongest, simplest and best.

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Gas Heaters

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Beautiful in Design

Popular Everywhere

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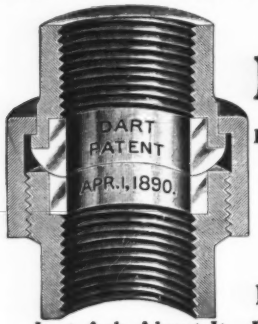
A Union forever



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Best in the World

Bronze Ball Seats
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Manufactured by

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Just Ask About It — Providence, Rhode Island

A "Perfect" Radiator Shield

The "Perfect" Shield makes its appearance this season in a new dress. It has been redesigned to meet the demand for a high grade article which would be in harmony with other finishings in a fine modern dwelling. It is nice enough for the finest room and cheap enough to be an item of Economy in any class of buildings. It will protect your walls and ceilings and improve the radiation. It will fit any radiator and is provided with firm fastenings. It is made of crimped Galvanized Steel with double top. For further information and prices address

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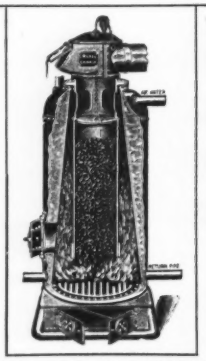

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ALL STEEL

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FOR SUPPLYING HOT WATER FOR APARTMENT BUILDINGS, HOTELS, BATH HOUSES, ETC., ETC.

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You Make no Mistake

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We stand behind them with large stocks carried by ourselves and prominent jobbers in the principal cities, prepared to replace at a moment's notice any that may be found defective.

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Patterns, Dies, Etc.

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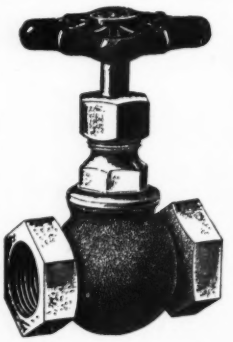

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HIGH-GRADE WORKMANSHIP
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GENUINE STEAM METAL
THOROUGHLY TESTED

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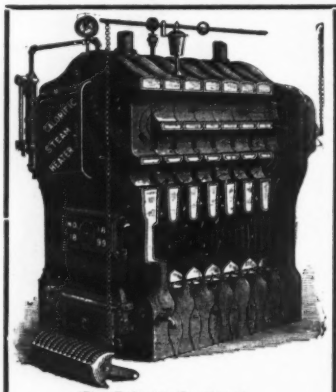

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Also make Calorific Gem and Calorific Junior.....

Agents treated fairly and wanted.....

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Made of the best material. Simple in construction. Can be regulated to heat the water at any desired temperature. Maintains that temperature at all times. Works perfectly automatic, the thermostat turning on the gas whenever the hot water is drawn, and shutting it off as soon as the inflowing cold water is raised to the required temperature. Can be attached to a radiator and thus easily heat a bath-room, when other heat is not obtainable.

Manufactured by

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ARE MADE OF
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GUARANTEED

NOT TO BREAK

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One DUPLEX plug will test 2-in. 3-in. 4-in. soil pipe and with extra plate the same plug will test 5-in. and 6-in. pipe.

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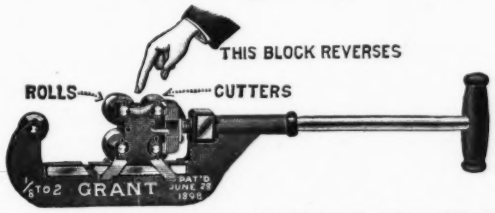

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Cuts with 3 cutter wheels, or with 1 cutter and 2 rolls.
CHANGES INSTANTLY
Strong, light and simple. Nothing to get out of order.

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HAS NO EQUAL
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Ask Your Dealer for Them.
They Save Trouble
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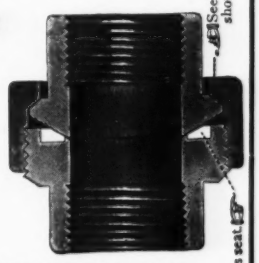

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For heating dwellings and other buildings, also for green house heating.

Saves fuel, heats quickly.

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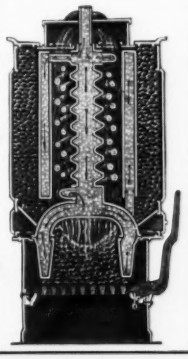

A. L. Swett
IRON WORKS,
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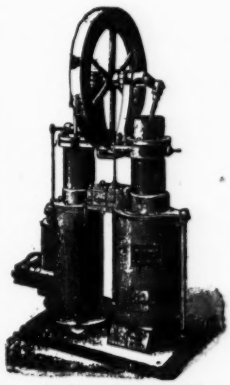

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HOT AIR PUMPING ENGINES

The most Reliable and Economical Engines for pumping water. Use any kind of fuel. Can be operated by any one. Perfectly safe, Noiseless, and Always ready for service. Important Improvements Patented and NOT FOUND in any OTHER MAKE of engines. Send for catalogue and testimonial list.

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Adapted to the heating of buildings of any kind and size. Has all the advantages of Hot Water without its objectionable features.

Absolutely Noiseless. No Pressure. No Air Valves. No Pumps nor Machinery. Heat under Perfect Control. Send for Catalog.

Installed by all steamfitters. Superior to any other system of heating.

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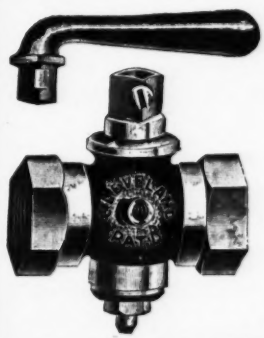

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Stop and Waste
Cocks

Can be used under all conditions. We keep a stock of all styles and can serve you promptly.

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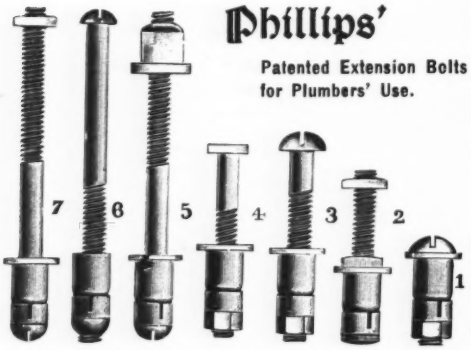

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Lengths from ⅞ to 3½ in. Diameter ¼ inch and other smaller sizes for Bath room fittings.

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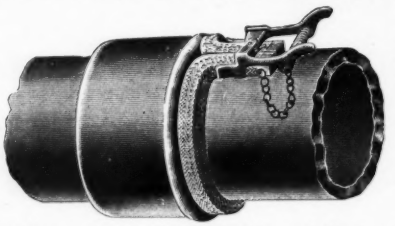
Vanderman's Patent Asbestos Lead Joint Runner.

Time Saver and Sure Joint Maker for Plumbers, Water and Gas Companies.



Red-hot lead does not affect it, and if occasionally soaked in oil it will last a life time.

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Our line handled by all jobbers.

The Vanderman Plumbing & Heating Co., Willimantic, Conn.

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The Celluvarno Closet Seat

The very latest Sanitary Closet Seat on the market; absolutely urine proof.

Ask your jobber about CELLUVARNO Seats.

If he won't supply you, write us and we'll tell you who will.

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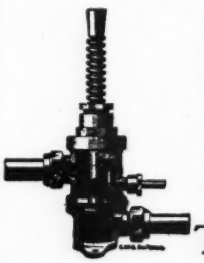

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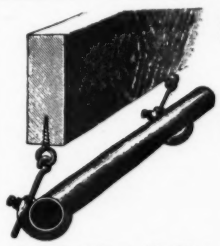

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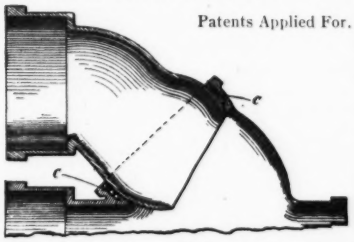

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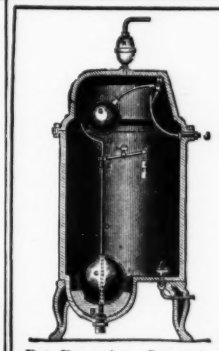

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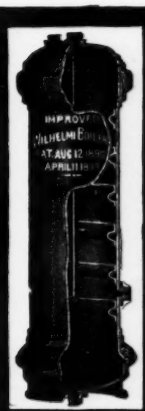

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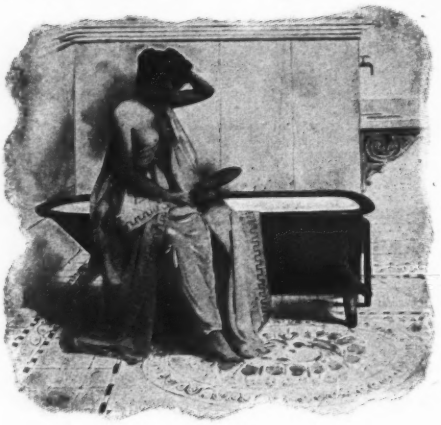

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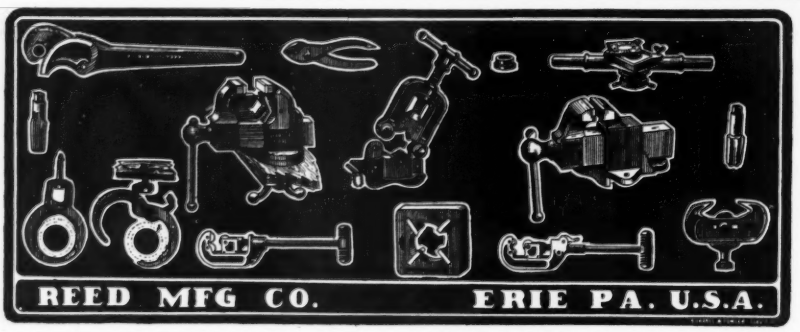

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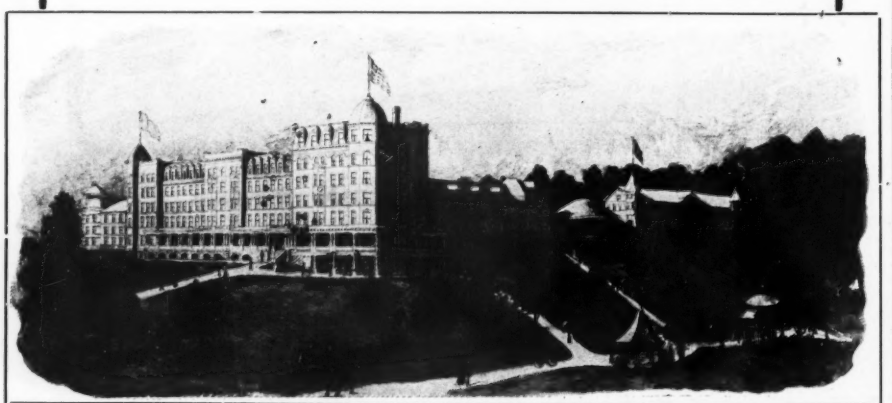

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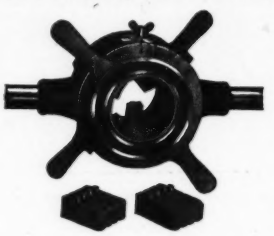

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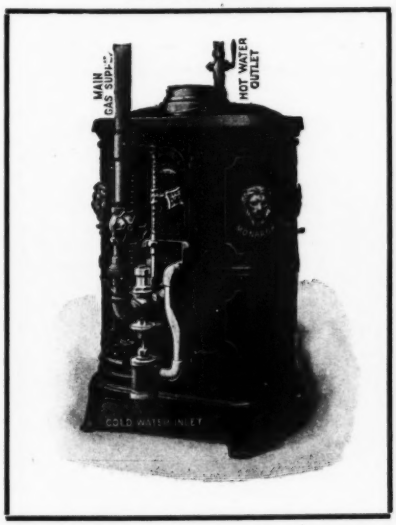

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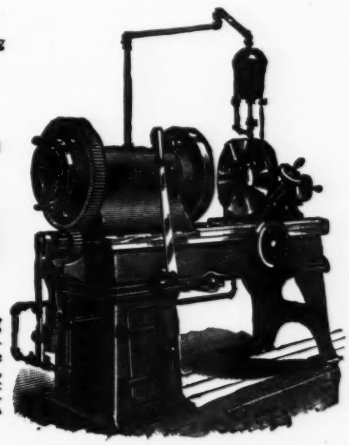

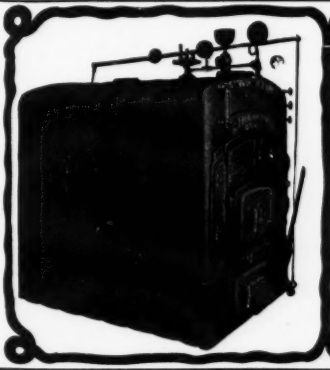

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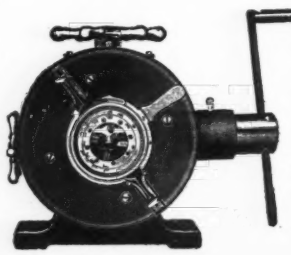

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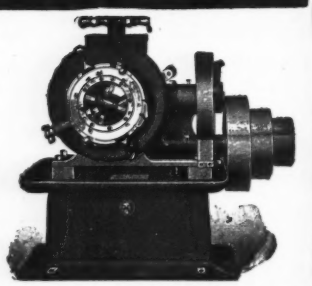

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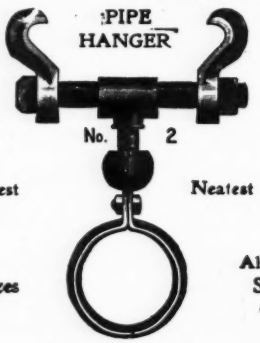

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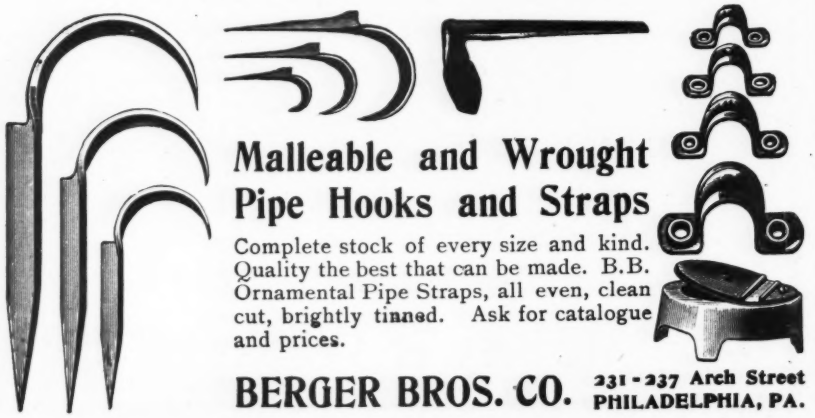

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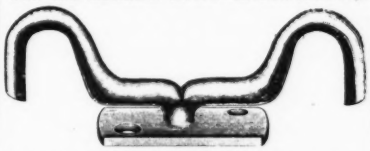

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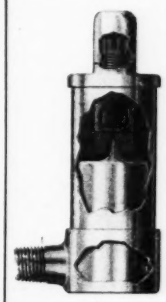

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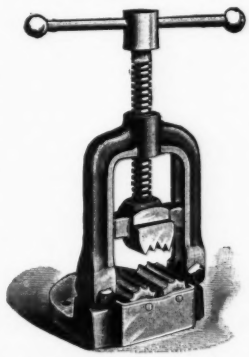

No. R, holding Pipe	⅛	to	2	inches.
No. R, R, "	"	¼	"	3	"
No. S, "	"	½	"	4	"
No. T, "	"	2	"	6	"
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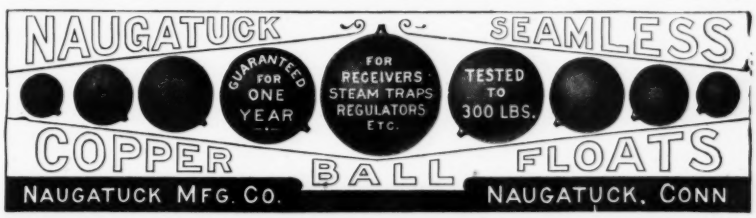

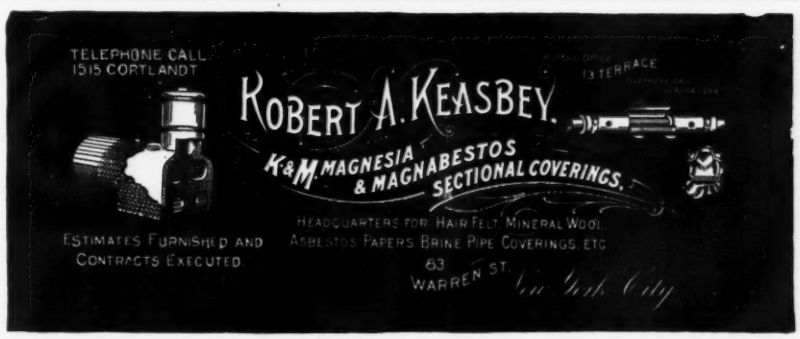
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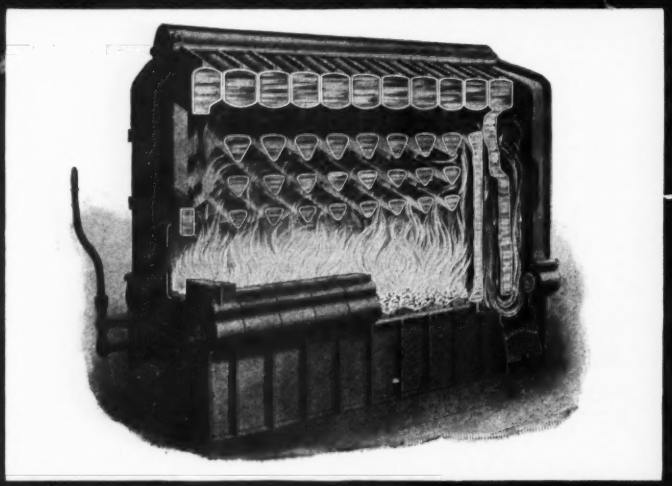

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TIGHT JOINTS,
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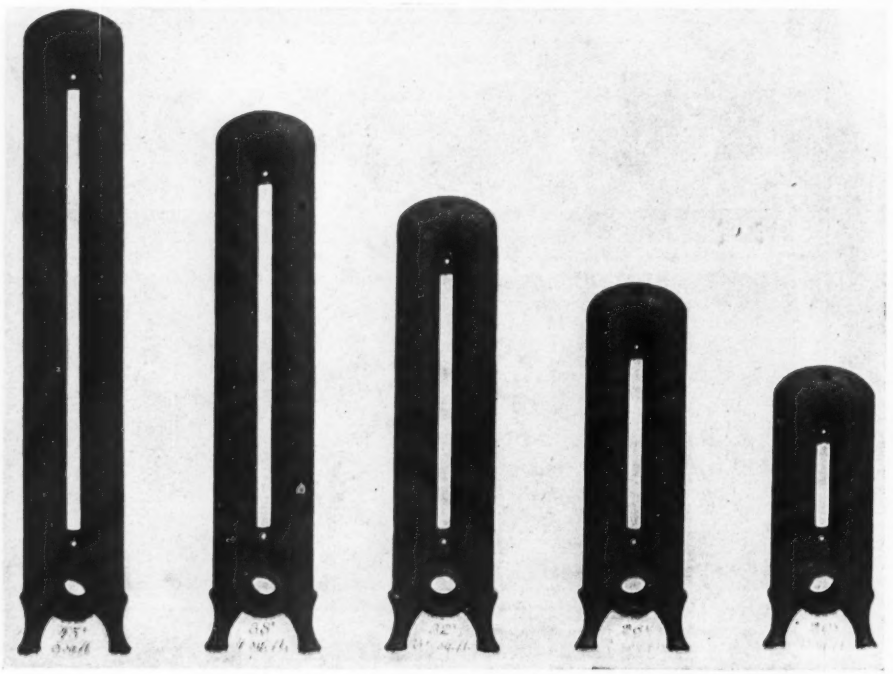

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Plumbing and Household Sanitation—XXV.

A Course of Lectures which, when completed, will cover the theory and practice of the art.

By J. Pickering Putnam, of Boston, Mass.

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These may be subdivided as follows:

(1) The Flange joint into: (a) The Spigot and Socket Flange joint; (b) The Spherical flange joint; (c) The Loose Ring flange joint; (d) The Wedge and Key flange joint; (e) The Plain non-adjustable flange joint; and (f) The Plain adjustable flange joint.

(2) The Sleeve joint into: (a) The Lead Packing sleeve joint; (b) The Plain Ring sleeve joint; (c) The Divided Ring sleeve joint; and (d) The Bolted Ring sleeve joint.

(3) The Screw joint into: (a) The Flange screw joint; (b) The Inner Ring screw joint; (c) The Outer Ring screw joint; and (d) the Plain screw joint.

(4) The Bell and Spigot joint into: (a) The Hand-Caulked lead joint; (b) The Machine-Caulked lead joint; (c) The Rubber Ring joint; (d) The Soft Packing joint; (e) The Ball and Socket joint.

(*1*) *The Flange Joints.*

Flange joints are those which are made with flanges forming bearings for bolts or clamps, by means of which the pipes are secured together. Our first example is:

(a) The Spigot and Socket flange joint represented in Figs. 285 and 286. The pipes are here made with circular

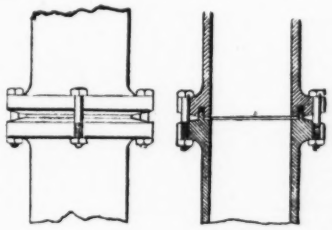


Fig. 285 Fig. 286

flanges, one having an annular groove on one end, and the other a corresponding annular projection or spigot, both being slightly beveled. The flanges have four or more slots in their periphery at uniform distances apart. A suitable packing ring, usually of lead, is placed in the groove and compressed by screwing up the bolts which pass through the slots. The ordinary steam-fitters' flanged joint differs from this in having plain level surfaces without groove or spigot. The steam-fitters' packing consists of paper, leather, rubber, or composition rings with or without putty, red lead or other filling. The surface of the flanges is for the best work, planed off, to give proper tightness, and instead of slots, holes are usually used to take the bolts. These kinds of joints are unsuitable for plumbing purposes, because they are not adjustable and do not admit of slight variation in direction of the piping, as is absolutely necessary in plumbing work. The machine planing of the steam fitters' flanged pipes, moreover, involves too great an expense to render the joint practicable for plumbing purposes.

Figs. 287, 288 and 289 show a joint devised with a view to overcoming the first of the above-mentioned objections to the ordinary flange-joint. On each side of the pipe are cast curved projections or collars extending only partially round its circumference. A flanged collar, recessed to correspond with the curved projections, is slipped over the end of each pipe and turned partly round behind the pro-

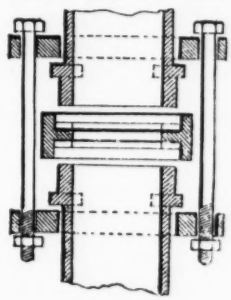


Fig. 287

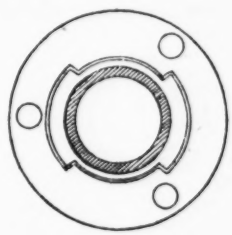


Fig. 288

jections. The flanges are thus held securely on the pipe, which may be adjusted in a variety of positions. An annular connecting piece, recessed to receive packing rings, is placed between the pipes to be joined. These connecting pieces are made with one or both faces at any desired angle to the bore of the pipes. A short portion at each end of the pipes is made somewhat thicker than the main length, so that at the extreme ends a wider surface of metal is obtained for the packing ring to rest against. Fig. 289 shows the same joint with the bevelled connecting pieces to give a change of direction to the piping.

There are several objections to this form of joint. The slotted collars occupy too much space and are liable to be easily broken in screwing the pipes together, especially at those points where the flange is weakened by the bolt hole and yet has no support immediately below. Moreover, the arrangement, though allowing a certain amount of play of the pipes in adjusting them, still limits their movement and would cause considerable annoyance in handling. The very long bolts are expensive and awkward. The heads and nuts do not rest square on their bearings when the bevelled connecting rings are used. The bolts are, therefore, easily broken in screwing up, as I have found in experimenting upon them in this connection, unless bevelled washes are used, which still further increases the cost.

Moreover, lead for packing is entirely unsuitable, since longitudinal expansion of the pipes will compress the lead, and subsequent contraction will then leave an annular opening for the escape of air or water.

Fig. 200 gives another form af flange joint devised with the same end in view. At one end of each length of pipe is a cone-shaped socket, having at opposite sides two lateral

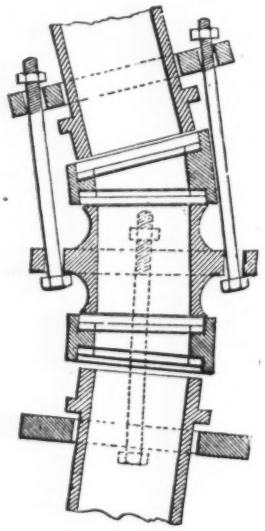


Fig. 289

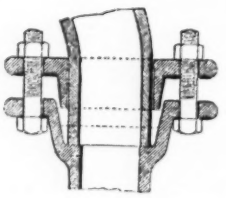


Fig. 290

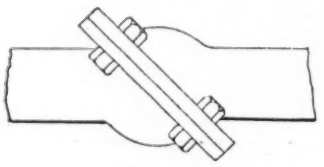


Fig. 291

projecting lugs with bolt holes. On the other end of the pipe, which is plain, is placed a loose flanged collar which has bolt holes to coincide with the holes in the lugs of the socket, into which the end or neck of the collar is free to enter. A packing ring of India-rubber, hemp, or other electric compressible substance, is placed on the end. The neck of the collar is then slid forward into the socket, and is brought to bear upon the packing by means of bolts, which are passed through the bolt holes. The joint is neither permanent nor tight under pressure. Moreover, it offers no resistance to longitudinal strain under which the two pipes might be drawn apart. If lead is used as a packing it would be compressed by both longitudinal and lateral expansion by heat and upon cooling again leakage is caused.

(*b*) *The Spherical Flange Joint.*

Figs. 291, 292, 293, 294 and 295 show another device for variable adjustment of the pipes. The parts at the

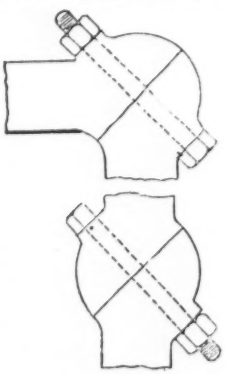


Fig. 292 and 293

Fig. 294

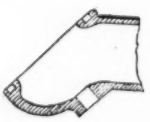


Fig. 295

points of junction are of spherical form, and the parts of the spheres where the junction takes place are inclined, by preference, to an angle of 45 degrees with the axis of the pipes, and are fitted with suitable packing and bolted as shown. This form of joint is evidently unsuitable for plumbing purposes. Should the bolt be made to pass through the center of the pipes as shown in the last four figures, it would form an obstruction to the flow of the sewage. If, on the other hand, the bolts are made to pass through the flanges, as in Fig. 291, the amount of possible variation of adjustment would be limited to the number of holes made in the flanges, and the piercing of these holes would not only add to the expense in proportion to their number, but also weaken the flange. Another serious objection lies in the sewage watering caused by the spherical sockets.

(*c*) *The Loose Ring Flange Joints.*

Around each end of the pipes to be jointed is formed a projecting annular flange or rib of rectangular sections. A band of rubber is placed over the joint, and upon this band a cast-iron collar or belt in two halves. The edges of the iron band turn inwards so as to form shoulders on each side of the rubber band to protect them. The joint is perishable and unreliable under pressure.

Figs. 296 and 297 represent another form of the same kind of joint. The pipes are formed with a bevelled flange. A rubber ring is used, as before, as packing, but the ring

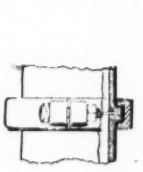


Fig. 296

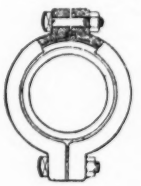


Fig 297

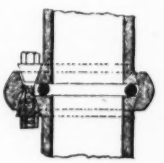


Fig. 298

Fig. 299

is placed between the ends of the pipes instead of around the joint. The metallic ring which holds the pipes together is double-wedge shaped in sections and slotted so as to allow it to be passed over the flanges. A bolt with a wedge-shaped head is used to hold the whole in place.

(*d*) *The Wedge and Key Flange Joint.*

The flanges are here connected by means of dove-tailed wedges or cotters and keys, instead of the ordinary bolts and nuts. Instead of the ordinary slotted openings, which are usually formed in the flange at each end of the pipe for the connecting bolts, the openings have a dove-tailed

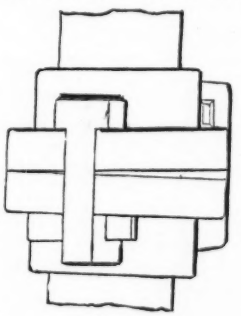


Fig. 300

Fig. 301

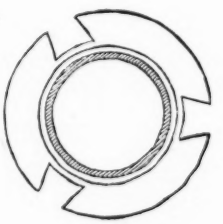


Fig. 302

form as shown in plan Fig. 300. When the faces of the flanges, with their intermediate packing, are placed in position to be connected, dove-tailed cotters or wedges are passed through the dovetail opening in the flanges, in the direction of the length of the ppes, and drawn up tight by keys driven through slotted holes in their ends. This construction is too bulky, inflexble and complicated for placing.

(*e*) *The Plain Non-Adjustable Flange Joint.* (*Fig. 303.*)

The flanges of the joint used for illustration have on their meeting surfaces annular grooves, circular or otherwise, to receive a packing ring, similar in form and composed of vulcanized India-rubber, hemp, or other suitable elastic material. The grooves in the flanges must be of corresponding size, so that one-half portion of a packing

ring may lie and be compressed in each when the flanges are drawn together. The object of the grooves is to prevent lateral derangement of the packing-ring under the influence of steam or water pressure in the pipes. The flanges of this joint are sometimes square with rounded corners, instead of round, and in the corners are the holes for the connecting bolts. This joint is also inflexible and unsuitable for

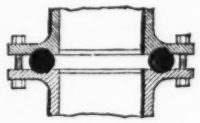


Fig. 303

plumbing work. The packing intended to be used with it would soon lose its elasticity and would occasion a leak when the pipes expanded and contracted longitudinally. Moreover, the annular space inside of the packing ring is an objectionable feature as forming shoulders on which matters passing through the pipes might adhere and cause stoppages.

The Plain Adjustable Flange Joint

will be described in another chapter.

(2) *The Sleeve Joint.*

The object of the sleeve joint is to form a connection between pipes having plain ends without flanges, hubs, threading or projections of any kind. The first division under this class: (a) The lead packing sleeve joint illustrated in Figs. 304 and 305. This joint was devised for use with

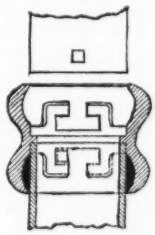


Fig. 304 and 305

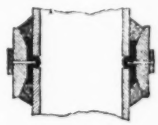


Fig. 306

wrought iron pipes in which it was desired to form connections like those on ordinary cast iron bell and spigot pipes and avoid weakening the pipe by thread cutting. It produces an even, smooth interior of the same diameter with the pipe, and could be made to form in part a rust joint. The lugs or rivets on the ends of the pipe engage in the recesses in the couplings and form a resistance to longitudinal strain. The joint is intended to have packing introduced, but the space is too contracted on the outside to permit of caulking. It is a form of bayonet joint. It has no flexibility to facilitate setting and would be unsuitable for plumbing work.

Fig. 306 shows a lead packed joint designed to be made with lead in its cold state, aided by cement. The joint is somewhat complicated and difficult to make. It is composed of a leaden ring of peculiar construction, two cast iron coupling rings, cement for solidifying the joint, and a hoop for covering the coupling rings. The leaden ring is a band of milled or rolled sheet lead with a groove in the center. To join the rings, the band is cut to the length corresponding with the outer circumference of the pipes to be connected. It is then bent into the form of a ring, and the two ends are soldered or burned together by means of a blowpipe. The ring is placed over the ends of the pipes and pressed tightly against it by light blows of a hammer, or by means of a metallic band with pincers, or by a cramp in such a manner that the lead shall be thoroughly embedded in the pipe.

In th groove in the leaden ring temporary sheet iron discs, formed in two parts and held together by hooks, are then placed. The two coupling rings are then pushed against the disc, which by resisting allows of and facilitates the junction, at the same time preventing the groove from being flattened or closed. The junction being completed, the disc is removed and the outer hoop is placed over the whole, and cement is put in the empty spaces between the coupling rings and the pipes beyond the lead ring.

The groove in the leaden ring is designed for the purpose of giving a certain flexibility to the joint, and allowing of expansion and contraction of the pipes, and I introduce it on account of its ingenuity and to illustrate the pains taken in the effort to overcome the destructive effect on lead packing by expansion and contraction.

The method here tried is ineffective and the joint is open to all the objections of the ordinary lead caulked bell and spigot joint.

Figs. 307 and 308 represent a sleeve joint in which rubber is used for packing. A hollow cylnder or shell is constructed of brass or iron, and has belts cast upon it for

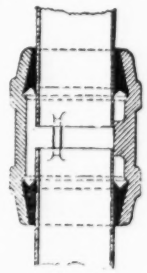


Fig. 307

Fig. 308

Fig. 309

additional strength. The ends are bevelled or inclined inwards towards the pipe, so as to contract the opening for the insertion of the pipe, and to form recesses into which are forced annular conical India-rubber rings or other similar packings. These rings or packings are so formed that when internal pressure is applied they press against the contracted ends of the cylinder to give rigidity to the joint, but when flexibility is desired, the webs are omitted.

Fig. 309 shows one side of a pipe having a cold lead packing ring. The pipe is shown partly in elevation and the packing and clamping rings in section. The ends of the pipe are here provided with slight enlargements or collars. A strip of lead, shaped to fit the enlarged ends, and having a central rib underneath to project into a space left between the ends of the pipes, is lapped around so

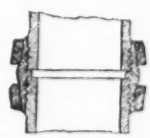


Fig. 310

as to embrace the ends of the pipes. A circular band or collar is then tightened round the lead by a "press collar," and finally all is secured by binding rings. The ends of the pipes abut against the central rib of the lead and prevent shifting of the packing when the binding rings are driven on. These rings are formed to fit the outer surface of the pipe, in order that their binding pressure may be equally distributed.

Fig. 310 shows a sleeve joint in which the ends of the pipe are grooved or corrugated and connected by means of a lead ring compressed into the corrugations. This lead ring is of double conical form externally, and has at the middle of its length an internal annular rib which forms an abutment for the ends of the pipes to be coupled. The joint is completed by forcing over the opposite ends of the leaden sleeve conical clamping rings, which, when driven home by means of a hammer or cramp, will compress

the lead into the annular grooves. Collars, brackets or ears may be cast on the pipes at some little distance from the ends, to prevent injury to the joint or pipe in ramming the earth about it when it is used under ground.

In all these lead packed joints the same weakness is inherent. They fail under expansion and contraction of the pipes, the corrugations forming no more protection in restraining this force than a rope of sand.

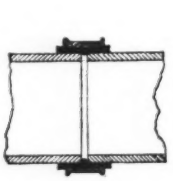


Fig. 311

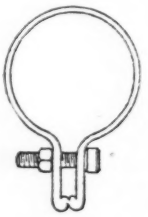


Fig. 312

Figs. 311 and 312 show a sleeve joint in which a rubber band is used for packing, secured by means of an elastic metallic strap. The India-rubber in a broad band is made to embrace the two ends of the pipes. Over the band is then placed a metallic strap, which is drawn together by means of screws or wedges. The tightening of the strap forces the India-rubber band into a number of annuular grooves with which the strap or ends of the pipe are furnished.

Figs. 313 and 314 show a joint similar to the last, except that a small bead is formed on the ends of the pipes, and the sleeve is bevelled, or wider on one side than on the other, to enable the pipes to be connected on an angle. The edges of the metallic collar used to compress and hold the rubber packing sleeve are turned down, as shown, so as to bring the packing close down over the beads. The collar is strained on by means of a bolt and nut, in the same manner with that in the joint preceeding.

Fig. 313

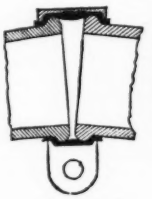


Fig. 314

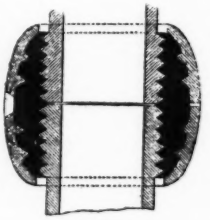


Fig. 315

Fig. 315 shows a sleeve joint for cement or melted lead packing. A movable or shifting sleeve or jacket is placed over the ends of the pipes, and has openings for the introduction of the packing. The ends of the pipes are grooved, and corresponding grooves are cast on the inside of the sleeve. These are intended to protect the pipes from longitudinal movement. The joint is bulky and expensive.

Coatings for Cast-Iron Pipes.

By Thomas H. Wiggin.

Read before the Boston Society of Civil Engineers.

Concluded.

Asphalt Coatings.

It is truly charged against coal-tar that it continues to decompose, so that finally nothing but a friable, earthy pitch is left. It is said to be characteristic of pyrogenic (fire-formed) compounds, to which class coal-tar belongs, that they are unstable at ordinary temperatures. Asphalt also decomposes with exposure, as demonstrated at the natural asphalt lakes, but nevertheless is thought to be more durable than coal-tar. The only direct long-time comparisons that occur to the writer are in the matter of walks and pavements, and here there is no doubt that the asphalt has demonstrated its superior durability. However, the conditions in a water pipe are different from those of a street surface; moreover, a coating material might be very durable in *itself*, and yet not form an *impervious* coating, as is the case with pure linseed oil used alone. Asphalt has not the aggressive penetration of coal-tar, nor does it stick to things and cover everything so persistently as tar. A little drop of tar will smirch skin, clothes, paper and everything that comes near it without apparent diminution in size, while asphalt can be handled with impunity.

The usefulness of asphalt as a pipe-coating compound for cast-iron has never been demonstrated; though asphalt has been and is still used largely in coating steel pipes, some information on its success for steel pipes should be available by this time, but little has been published.

The writer tried many experiments with Alcatraz, or California asphalt. Grades of several degrees of hardness are made, and by mixing grades it is comparatively easy to get a good consistency. A temperature of about 260 degrees F. was needed. The coating is not brittle, not very smooth, rather dull and not very tenacious. In fact, the impressions of the coating were rather of a negative nature. There were no glaring defects in the coating, neither was it very attractive.

Linseed mixes well with asphalt, but the coating does not harden unless a hard grade of asphalt is used.

P. & B. Pipe Dip.

This is a patent dip manufactured by the Standard Paint Company. Its principal ingredients probably are asphalt and candle-tar pitch. The latter is a pitch obtained by distillation of animal fats. This coating has been used somewhat on steel pipes, but not long enough for a test of durability. As applied to cast-iron, it gives a coating very similar to asphalt coating, *i. e.*, not hard, not brittle, not very glossy, not very tenacious.

Mineral Rubber Dip.

This is a dip manufactured by the Assyrian Asphalt Company. The process is not patented, but is secret. The appearance indicates that the compound is largely asphalt, and the coating is somewhat similar to asphalt coating, only duller in appearance. The dip requires a temperature of about 400 degrees F. This dip has recently become very popular for steel pipes.

Varnishes.

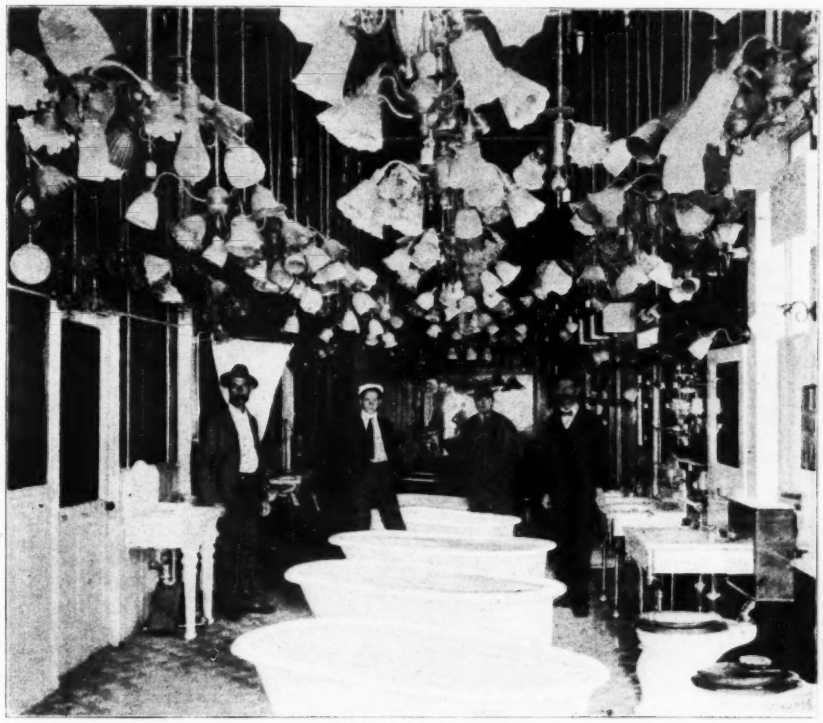
There are many cheap varnishes made from tar, and there are also more expensive ones containing asphalt and other ingredients. These varnishes consist of some solid dissolved in a volatile carrier which quickly evaporates, leaving the solid on the coated body. The engineers of the Metropolitan water-works have used a number of these varnishes in painting over the coal-tar coating, with the idea of filling up the pores in the coating. The writer has experimented with some of these varnishes.

1. P. & B. Universal paint, manufactured by the Standard Paint Company. This is to many a very familiar varnish, because it is not forgotten after having been once

used. The solvent contains carbon disulphide, the odor of which is sickening to most persons. The coating seems fairly good after it is on, but the odor interferes with its use.

2. P. & B. ruberine, also manufactured by the Standard Paint Company. This varnish consists of "ruberoid" dissolved in naphtha. Ruberoid consists of California asphalt and candle-tar pitch digested and vulcanized with sulphur. Ruberine dries rapidly and is hard to spread smoothly. It gives, however, a substantial, rubbery coating.

3. Tar varnishes. Two of these were tried, one an American and the other a Dutch product, imported by Paul A. Davis, of Philadelphia, and said to be much used abroad The varnishes were thin, had the coal-tar penetration, and gave smooth, good-looking coatings.



Interior View of the Plumbing Shop of A. H. Shafer, San Antonio, Texas.

It is evident that the use of varnishes would be very limited, unless it were found possible to use them as dips; their rapid evaporation seems to preclude their use in this way; but trial alone, and on a large scale, would settle this question.

Tests of Coatings.

Of course, the only satisfactory test of coatings is actual use under known conditions. Small-scale experiments are often misleading and always inconclusive. Moreover, all coatings are so durable that it takes a number of years to form an idea of their relative value, and by that time something new is often favored on theoretical evidence. However, the small specimens used in the experiments above described were subjected to several tests:

1. Test for brittleness. Most of the specimens were tested by hammering to see whether the coating was liable to fly off in handling of pipes. Allusion to brittleness has been made in describing the coatings.

2. Test of porosity. It is known that tubercles start at minute holes in coating. It was thought that if acid did not injure the coating material itself, it would give a test of the porosity of coatings by attacking the metal through the pores. Specimens of coated iron were put in glass jars containing a mixture of one part muriatic acid and two parts water. At the same time samples of the coating materials alone were put into the other glass jars with acid of the same strength. Great activity was immediately apparent in the case of the coated iron, and a disagreeable gas with a sweetish odor was evolved. The coating materials alone, on the other hand, were apparently not acted upon. Their appearance, and the appearance of the acid in which they were submerged, remained the same to the end of the test, which was almost as long as the test of the coated iron.

The coatings were all badly undermined, and all but a specimen of Sabin's japan peeled off in many places. The iron was dissolved to the depth of $\frac{1}{8}$ inch in places, especially at the corners. The following is the estimate that was placed upon the specimens, beginning with the least injured:

Table A.—Acid Treatment.

Order.	Coating.	Time exposed; days	Remarks.
I.	Sabin japan	55	Specimen said to have been rusty before being coated.
II.	Crude tar	55	
III.	Tar and linseed	60	No distinction possible.
	Alcatraz asphalt, pitch and linseed	60	
	Mineral dip (Assyrian Asphalt Co.)	55	
	P. & B. dip (Standard Paint Co.)	55	
IV.	Alcatraz asphalt	55	
V.	All the varnishes	55	Totally destroyed

There was *only one* specimen of each coating.

3. Running water test. The following specimens have been kept in running Boston water. Many tubercles have already formed on corners and on the rough fractured edges, but only a few on the smooth large faces that formed parts of the inside and outside, respectively, of the pipes from which the specimens of iron were broken. The writer's estimate of the coatings is as follows:

Table B.—Boston Water Treatment.

Order.	Coating.	Time exposed; years.	Remarks.
I.	Tar and linseed	2	The coating is smooth and in good condition, except for a group of five ¼-inch tubercles.
II.	Mineral dip	2	Few Tubercles on large surfaces, but coatings rather earthy.
	P. & B. dip	2	
III.	Alcatraz asphalt	2	Badly tubercled and covered with crumbling blisters.

There was only one specimen of each coating.

The following samples have endured four months in running Delaware river water—whereby they were scarcely tubercled at all, but received a heavy coat of mud—washings to remove the mud, and finally seventeen months in running Boston water, where they still are. The specimens have only three to five incipient tubercles and a few specks on the large surfaces, though there are a good many well developed tubercles, as usual, on the rough edges of fracture and around the copper suspension wire. In general appearance the writer would rank them as follows:

Table C.—Delaware River Water Treatment.

Order.	Coating.	Remarks.
I.	Pitch,	Coating still glossy.
II.	Pitch and linseed,	Coating still glossy.
III.	Pitch and linseed painted over with Dutch varnish.	
IV.	Mineral dip, P. & B. dip.	Tubercles not more numerous than in the case of the foregoing specimens, but the surfaces rather earthy in appearance and not smooth.
V.	Dutch varnish,	Freer from tubercles than any of the other specimens, but the surface is earthy and friable, black powder being easily scraped off.

There was only one specimen of each coating.

The following specimens endured the same treatment in Delaware water and subsequent washing off of mud, and were finally placed in a tank of water that is not often changed, where they have been about 15 months. The tank has been used for much of the time for cement briquettes, and the water is hence very alkaline:

Table D.—Alkaline Water Treatment.

Order.	Coating.	Remarks.
I.	Pitch,	In good condition; few tubercles.
II.	Tar covered with Dutch varnish,	" " "
III.	Tar and linseed,	" " "
IV.	Alcatraz asphalt, pitch and linseed.	" " "
	Tar,	
V.	Mineral dip,	In fair condition.
	Alcatraz asphalt and linseed (2 specimens),	" " "
	Alcatraz asphalt, pitch and linseed (another specimen),	" " "
	P. & B. paint (2 specimens),	Few tubercles, but coatings are rather earthy; black will rub off.
	Dutch varnish,	
VI.	Mineral dip (another specimen),	In bad condition; many well developed tubercles; also crumbling blisters.
	P. & B. dip,	
	Alcatraz (2 specimens),	

There was only one specimen of each coating except in the cases specially noted above.

The following table gives a *very rough* idea of the relative cost of the various coating materials. The crude tar results are based on actual records, and are believed to be reasonably close. The other results are mere estimates, based, in the case of the dips, on the results for tar; in the case of the varnishes, on estimated covering capacity, and in the case of the Sabin japan, on results for steel pipes:

Table E.—Comparative Cost of Pipe Coatings.

Coating.	Approximate amount required to coat one 48-inch pipe.	Approximate price.	Cost of material for one 48-inch pipe.
Crude tar	3¾ gals.	$ 3.00 per bbl. of 52 gals.	$0.22
Pitch	5 "	5.00 " " "	0.50
Pitch and linseed			0.70
P. & B. dip	20 lbs.	45.00 per ton	0.45
Mineral dip	20 "	75.00 "	0.75
P. & B. Univers. paint	1½ gals.	1.00 per gal	1.50
P. & B. ruberine	1½ "	1.00 "	1.50
Tar varnish	1½ "	0.10 "	0.15
Dutch varnish	1½ "	0.25 "	0.40
Sabin japan	1½ "	1.75 "	2.60

Conclusions.

Should the Sabin japan prove by use to be as good as it appears to be, engineers would have to decide whether it were economical to add from 5 to 10 per cent. to the cost of pipes in order to prevent in part a deterioration in the carrying capacity, which has been found as large as 20 per cent. in 16 years in even large pipes. But the efficacy of the coating must be proved by several years of use.

As for the above tests, the tar compounds seem to have the best of them on the whole (barring the Sabin japan, which was tested only by acid), though the tests are *too few* and *too short* to serve as a basis for decided opinions. The writer would like to try roofing pitch on some pipes. He has considerable faith in the efficacy of thick, smooth coatings, such as it makes. The experiments show that only a thick coating will protect rough surfaces and corners. If the pitch proved too brittle to stand the handling of shipping and carting, it would not be impossible to have a portable coating outfit. The writer would also like to see a refined tar and linseed-oil coating tried on the commercial scale. He would suggest that it would not be a very expensive experiment for a large city to try the several coatings on some line of its pipes and thus determine in a rational way what water pipe coating was best.

Rusty pipes will apparently not hold a coating. At one foundry were several 30-inch pipes having only little blotches of tar coating left on them. The writer was told that these pipes were coated only two years before, but were very rusty when coated.

The foundry scale, which forms the surface of castings, will protect the castings from rust for some time. Even when a casting is allowed to stand in a shower or two, only streaks of rust on top are formed at first. All chipped surfaces, however, quickly rust, and it is noticeable that coating over chipped surfaces is often quickly destroyed. Whether this is due to the surface being rusty before coating, or to a poor adhesion of the coating to even clean chipped surfaces, is unknown to the writer.

Old Sanitary Theories Assailed.

WILLIAM T. SEDGWICK, professor of biology and lecturer on sanitary science and the public health in the Massachusetts Institute of Technology, and at one time biologist to the board of health of that state, has recently published a work on sanitary science in which he not only upsets many popular beliefs, but takes direct issue with many scientific theories which have come to be accepted as law and gospel.

Professor Sedgwick thinks that the danger of sickness from the emanation of gases from sewers, drains, cesspools, etc., is greatly exaggerated. The air in sewers being unusually quiet, he claims it is comparatively free from bacteria. Stagnant sewage, as found in cesspools, is more dangerous, but even this he does not believe produces specific diseases, such as typhoid fever and diphtheria. He finds no connection between broken drains and epidemics, and says on this point: "It is difficult to understand how the accumulation of sewage in a cellar, or leakages of sewage

from broken drains, or the escape of gases from such drains, can possibly provoke infectious diseases."

Furthermore, Professor Sedgwick relieves the atmosphere of much responsibility for the propagation of certain disease. He takes no stock in late springs, hard winters, newly turned-up soil or prolonged cloudy weather as producers of disease. He does not believe in the unwholesomeness of damp cellars. He prefers old water to fresh water, because in the former the harmful bacteria have had time to die out, and claims that river water is less dangerous when the river is low than during freshets. He states the paradox that "whenever water is freshest it may be least safe; and when rich in sewage it is not necessarily more dangerous."

Professor Sedgwick runs counter to nearly all the accepted theories of sanitary science, and this brings up the old question: When the doctors disagree, what are you going to do?

Novel Concrete Sewer Construction.

THERE has recently been completed near Syracuse, N. Y., for a large manufacturing concern, a very remarkable sewer. This sewer has to take care of 20 million gallons of water per day, which is used by the company for cooling purposes. The sewer is 2,000 feet long and in its construction was used over 50,000 square feet of expanded metal. The metal is placed to form the shape of the tube and cement concrete placed on the inside and outside of the metal to form the thickness desired, being held in position until hard by wooden forms which are then removed. This makes a continuous tube without seams or joints.

Expanded metal is a unique material in the mechanical world. It was designed and invented with a view to a special purpose, to which it has been put to a very large extent, but it nevertheless found a very new and unexpected purpose and place of usefulness wherein it has achieved still greater distinction. Though apparently simple in the possibility of its manufacture, it has nevertheless required great skill to bring it to a point of commercial perfection. It is nothing more or less than plain sheets of steel, slit in regular lines and opened into meshes of any desired size or section of strand. The operations of shearing the steel and opening the meshes are simultaneous and are performed when cold. No material is wasted, and there are no pieces cut out. It was originally termed by the inventor "slashed metallic screening," and was intended as a material for fencing, window guards, etc. It is probable today that less than one per cent of the output is used for the originally intended purpose, the greater part of it now being used in all kinds of building construction. The finished sheets of the material are from three to eight times as large as the original sheet of steel, according to the size of the mesh, and they are produced with a uniform length of 8 feet, the width ranging according to requirement from 12 inches to 6 feet. The material is cut from steel, as light as 27 gauge, with meshes 3/8 inch, in which form it is used for lathing, and from that size to sheets cut from No. 4 gauge steel, with diamond meshes 5x12 inches, with many intervening sizes and widths.

There are in this country five large factories operating to their full capacity, besides seven other companies devoted to the sale and construction of the material in various forms, and known as the Associated Expanded Metal Companies. There are also half a dozen or more companies on the continent of Europe, besides one in Australia. It is probable that in this country alone the output for the present year will amount to more than 20,000,000 square feet of the various kinds produced.

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Heating and Ventilation—XVII.

PART III.

A Course of Lectures which, when completed, will cover the theory and practice of those arts.

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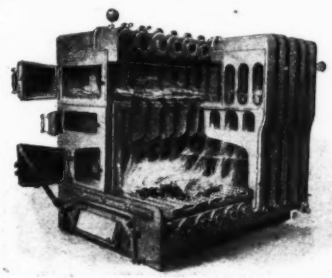
Temperature Regulators.

The principal systems of automatic temperature control now in use consist of three essential features: First, an air compressor, reservoir and distributing pipes; second, thermostats, which are placed in the rooms to be regulated; and third, special diaphragm or pneumatic valves at the radiators.

The *air compressor* is usually operated by water pressure in small plants and by steam in larger ones; electricity is used in some cases. Fig. 30 shows a form of water compressor. It is similar in principle to a direct-acting steam pump, in which water under pressure takes the place of steam. A piston in the upper cylinder compresses the air, which is stored in a reservoir provided for the purpose. When the pressure in the reservoir drops below a certain point, the compressor is started automatically, and continues to operate until the pressure is brought up to its working standard.

A *thermostat* is simply a mechanism for opening and closing one or more small valves, and is actuated by changes in the temperature of the air in which it is placed. Fig. 31 shows a thermostat in which the valves are operated by the expansion and contraction of the metal strip E. The degree of temperature at which it acts may be adjusted by throwing the pointer at the bottom one way or the other. Fig. 32 shows the same thermostat with its original casing in place. The thermostat shown in Fig. 33 operates on a somewhat different principle. It consists of a vessel sepa-



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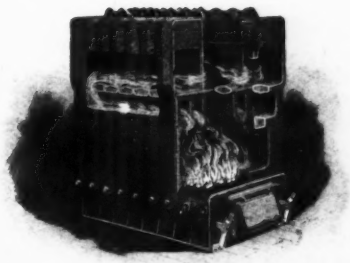

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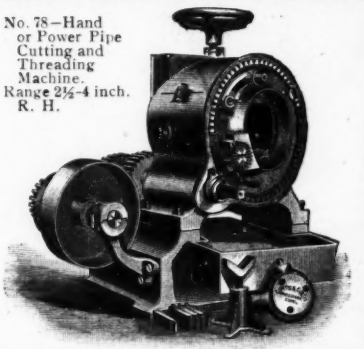

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rated into two chambers by a metal diaphragm. One of these chambers is partially filled with a liquid, which will boil at a temperature below that desired in the room. The vapor of the liquid produces considerable pressure at the normal temperature of the room, and a slight increase of heat crowds the diaphragm over and operates the small

Fig. 30.

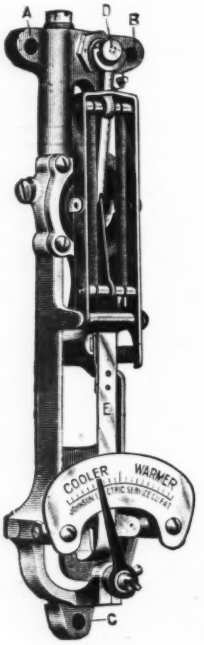


Fig. 31.

valves in a manner similar to that of the metal strip in the case just described.

The general form of a *diaphragm valve* is shown in Fig. 34. These replace the usual hand valves at the radiator. They are similar in construction to the ordinary globe or angle valve, except the stem slides up and down instead of being threaded and running in a nut. The top of the stem connects with a flat plate, which rests against a rubber diaphragm. The valve is held open by a spring, as shown, and is closed by admitting compressed air to the space above the diaphragm.

In connecting up the system, small concealed pipes are carried from the air reservoir to the thermostat, which is placed upon an inside wall of the room, and from there to the diaphragm valve at the radiator. When the temperature of the room reaches the maximum point for which the thermostat is set, its action opens a small valve and admits

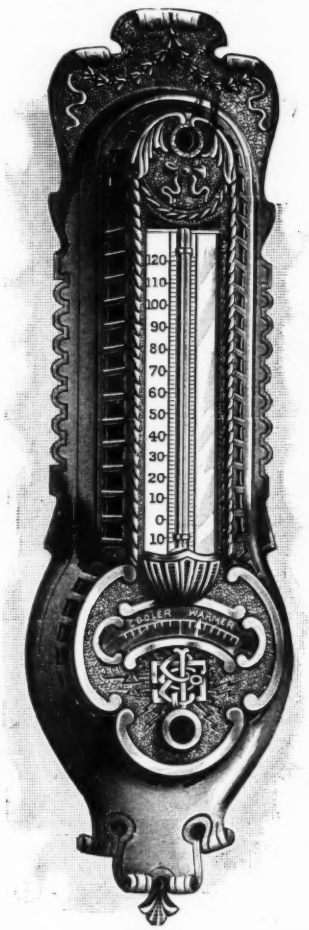
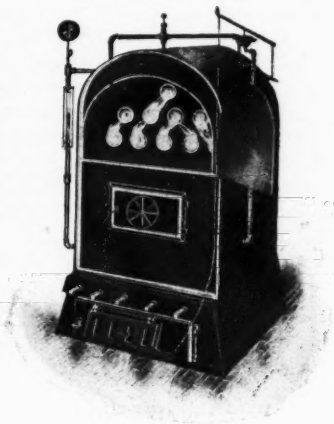


Fig. 32.

air pressure to the diaphragm, thus closing off the steam from the radiator. When the temperature falls, the thermostat acts in the opposite manner, and shuts off the air pressure from the diaphragm valve, and at the same time opens a small exhaust which allows the air above the



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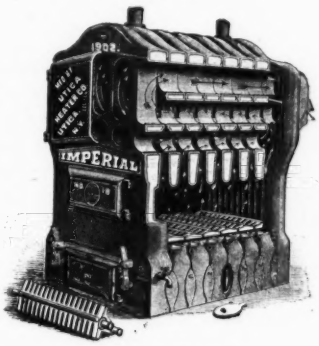

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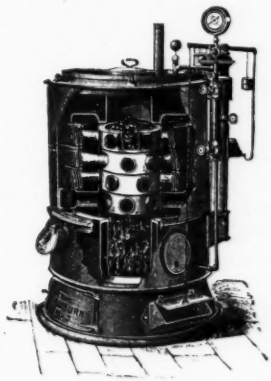

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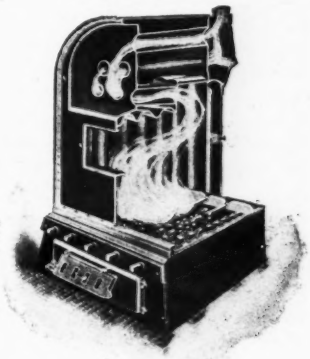

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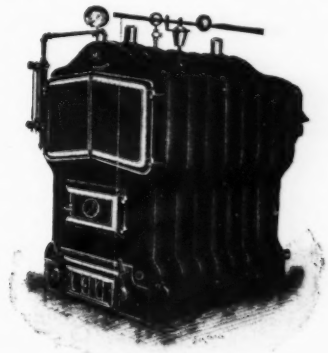

IMPERIAL STEAM

diaphragm to escape. The pressure being removed, the valve opens and again admits steam to the radiator. Thermostats and diaphragms are also used for operating mixing dampers in a similar manner.

Heating and Ventilation in Various Classes of Buildings

The different methods used in heating and ventilation, together with the manner of computing the various proportions of the apparatus, having been taken up, the application of these systems to the different classes of buildings will now be considered briefly.

School Buildings.

For school buildings of small size, the furnace system is simple, convenient and generally effective. Its use is confined as a general rule to buildings having not more

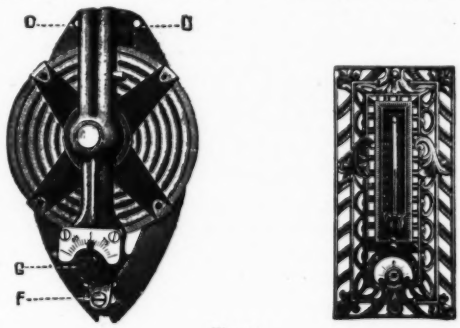

Fig. 33.

than eight rooms. For large ones this method must generally give way to some form of indirect steam system with one or more boilers, which occupy less space, and are more easily cared for than a number of furnaces scattered about in different parts of the basement. Like all systems that depend on natural circulation, the supply and removal of air is considerably affected by changes in the outside temperature and by winds.

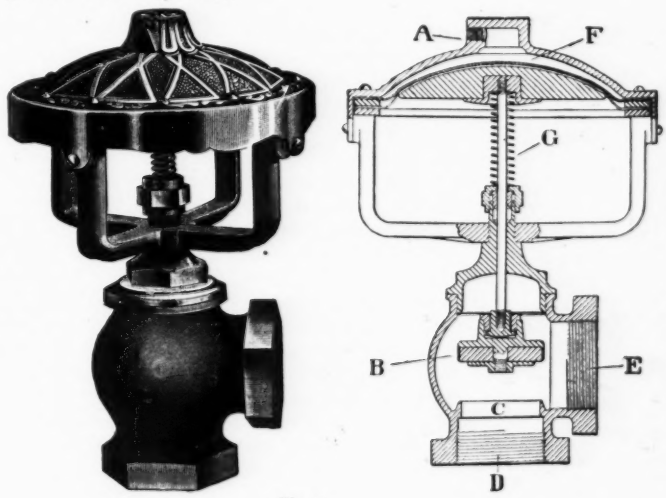

Fig. 34.

The furnaces used are generally built of cast iron; this material being durable, and easily made to present large and effective heating surfaces. To adopt the larger sizes of house-heating furnaces to schools a much larger space must be provided between the body and the casing, to permit a sufficient volume of air to pass to the rooms. The free area of the air passage should be sufficient to allow a velocity of about 400 feet per minute.

The size of furnace is based on the amount of heat

lost by radiation and conduction through walls and windows plus that carried away by air passing up the ventilating flues. These quantities may be computed by the usual methods for "loss of heat by conduction through walls," and "heat required for ventilation." With more regular and skillful attendance, it is safe to assume a higher rate of combustion in schoolhouse heaters than in those used for warming residences. Allowing a maximum combustion of 6 pounds of coal per hour per square foot of grate, and assuming that 8,000 B. T. U. per pound are taken up by the air passing over the furnace, we have 6 X 8,000= 48,000 B. T. U. furnished per hour per square foot of grate. Therefore, if we divide the total B. T. U. required for both warming and ventilation by 48,000, it will give us the necessary grate surface in square feet. It has been found in practice that a furnace with a fire-pot 32 inches in diameter, and having ample heating surface, is capable of heating two 50-pupil rooms in zero weather. The sizes of ducts and flues may be determined by rules already given under furnace and indirect steam heating.

The indirect gravity system of steam heating comes next in cost of installation. One important advantage of this system over furnace heating comes from the ability to place the heating coils at the base of the flues, thus doing away with horizontal runs of air pipe, which are required to some extent in furnace heating. The warm-air currents in the flues are less affected by variations in the direction and force of the wind where this construction is possible, and this is of much importance in exposed locations. The method of supplying cold air to the coils or heaters is important, and should be carefully worked out in the manner previously described. Mixing dampers for regulating the temperature of the rooms should be provided for each flue. The effectiveness of these dampers will depend largely upon their construction, and they should be made tight against cold-air leakage by covering the surfaces or flanges against which they close with some form of asbestos felting. Both inlet and outlet gratings should be provided with adjustable dampers. One of the disadvantages of this system is the delivery of all the heat to the room from a single point, and this not always in a position to give the bests results. The outer walls are thus left unwarmed, except as the heat is diffused throughout the room by air currents. When there is considerable glass surface, as in most of our modern schoolrooms, draughts and currents of cold air are frequently found along the outside walls.

A very satisfactory arrangement is the use of indirect heaters for warming the air needed for ventilation, and the placing of direct radiation in the rooms for heating purposes. The general construction of the indirect stacks and flues may be the same, but the heating surface can be reduced, as the air in this case must be raised only to 70 or 75 degrees in zero weather; the heat to offset that lost by conduction, etc., through walls and windows being provided by the direct surface. The mixing dampers are also omitted, and the temperature of the room is regulated by opening or closing the steam valves on the direct coils, which may be done either by hand or automatically. The direct-heating surface, which is best made up of lines of 1½-inch pipe, should be placed along the outer walls beneath the windows. This supplies heat where most needed, and does away with the tendency to draughts. In mild weather, during the spring and fall, the indirect heaters may prove sufficient for both ventilation and warming.

Where direct radiation is placed in the rooms, the quantity of heat supplied is not affected by varying wind conditions, as is the case in indirect heating. Although the air supply may be reduced at times, the heat quantity is not changed. Direct radiation has the disadvantage of a more or less unsightly appearance, and architects and owners often object to the running of mains or risers through the rooms of the buildings. Air valves should always be provided with drip connections carried to a sink or dry well in the basement.

When circulation coils are used, a good method of drainage is to carry separate returns from each coil to the basement, and place the air valves in the drops just below the basement ceiling. A check valve should be placed below the water line in each return.

The fan or blower system for ventilation with direct radiation in the rooms for warming, is considered to be one of the best possible arrangements.

In designing a plant of this kind the main heating coil should be of sufficient size to warm the total air supply to 70 or 75 degrees in the coldest weather, and the direct surface should be proportioned for heating the building independently of the indirect system. Automatic temperature regulations should be used in connection with systems of this kind by placing pneumatic valves on the direct radiation. It is customary to carry from 3 to 8 pounds pressure on the direct system and from 8 to 15 on the main coil depending on the outside temperature. The foot-warmers, vestibule and office heaters should be placed on a separate line of piping, with separate returns and trap, so that they can be used independently of the rest of the building if desired. Where there is a large assembly hall it should be arranged so that it may be both warmed and ventilated when the rest of the building is shut off. This may be done by a proper arrangement of valves and dampers. When different parts of the system are run on different pressures the returns from each should discharge through separate traps into a receiver having connection with the atmosphere by means of a vent pipe. Fig. 35 shows a common arrangement for the return connections in a combination system of this kind. The different traps discharge into the vented receiver as shown, and the water is pumped back to the boiler automatically when it rises above a given level in the receiver, a pump governor being used to start and stop the pumps as required.

A water level or seal of suitable height is maintained in the main returns by placing the trap at the required elevation and bringing the returns into it near the bottom; a balance pipe is connected with the top for equalizing the pressure the same as in the case of a pump governor. Sometimes a fan is used with the heating coils placed at the base of the flues, instead of in the rooms. Where this is done the radiating surface may be reduced about one-half. This system is less expensive to install, but has the disadvantage of removing the heating surface from the cold walls where it is most needed.

Churches.

Churches may be warmed by furnaces, indirect steam, or by means of a fan. For small buildings the furnace is more commonly used. This apparatus is the simplest of all and is comparatively inexpensive. Heat may be generated quickly, and when the fires are no longer needed they may be allowed to go out without danger of damage to any part of the system from freezing.

It is not usually necessary that the heating apparatus be large enough to warm the entire building at one time to 70 degrees with frequent change of air. If the building is thoroughly warmed before occupancy, either by rotation or by a slow inward movement of outside air, the chapel or Sunday-school room may be shut off until near the close of the service in the auditorium, when a portion of the warm air may be turned into it. When the service ends, the switch damper is opened wide, and all of the air is discharged into the Sunday-school room. The position of the warm-air registers will depend somewhat upon the con-

struction of the building, but it is well to keep them near the outer walls and the colder parts of the room. Large inlet registers should be placed in the floor near the entrance doors, to stop cold drafts from blowing up the aisles when the doors are opened, and also to be used as foot-warmers.

Ceiling ventilators are generally provided, but should be no larger than is necessary to remove the products of combustion from the gaslights, etc. If too large, much of the warmest and purest air will escape through them. The main vent flues should be placed in or near the floor and should be connected with a vent shaft leading outbound. This flue should be provided with a small stove or flue heater made especially for this purpose. In cold weather the natural draft will be found sufficient in most cases. The same general rules will follow in the case of indirect steam as have been described for furnace heating. The stacks are placed beneath the registers or flues and mixing dampers provided. If there are large windows, flues should be arranged to open in the window sills so that a sheet of warm air may be delivered in front of the windows, to counteract the effects of cold drafts from the exposed glass. These flues may usually be made 3 or 4 inches in depth, and should extend the entire width of the window. Small rooms, such as vestibules, library, pastor's room, etc., are usually heated with direct radiators. Rooms which are used during the week are often connected with an independent heater so that they may be warmed without running the large boilers, as would otherwise be necessary.

When a fan is used, it is desirable, if possible, to deliver the air to the auditorium through a large number of small openings. This is often done by constructing a shallow box under each pew, running its entire length, and connecting it with the distributing ducts by means of a pipe from below. The air is delivered at a low velocity through a long slot, as shown in Fig. 36.

The warm-air flues in the window sills should be retained, but may be made shallower and the air forced in at a high velocity.

Halls.

The treatment of a large audience hall is similar to that of a church, and is usually warmed in one of the three ways already described. Where a fan is used the air is commonly delivered through wall registers placed in part near the floor and partly at a height of 7 or 8 feet above it. They should be made of ample size, so that there will be freedom from draughts. A part of the vents should be placed in the ceiling and the remainder near the floor. All ceiling vents, both in halls and churches, should be provided with dampers having means for holding them in any desired position. If indirect gravity heaters are used, it will generally be necessary to place heating coils in the vent flues for use in mild weather; but if the fresh air is supplied by means of a fan, there will usually be pressure enough in the room to force the air out without the aid of other means. When the vent air ways are restricted, or the air is impeded in any way, electric ventilating fans are often used. These give especially good results in warmer weather, when natural ventilation is sluggish. The temperature may be regulated either by using the double duct system or by shutting off or turning on a greater or less number of sections in the main heater. After an audience hall is once warmed and filled with people, very little heat is required to keep it comfortable, even in the coldest weather.

Theaters.

In designing heating and ventilating systems for theaters, a wide experience and the greatest care are necessary to secure the best results. A theater consists of three parts:

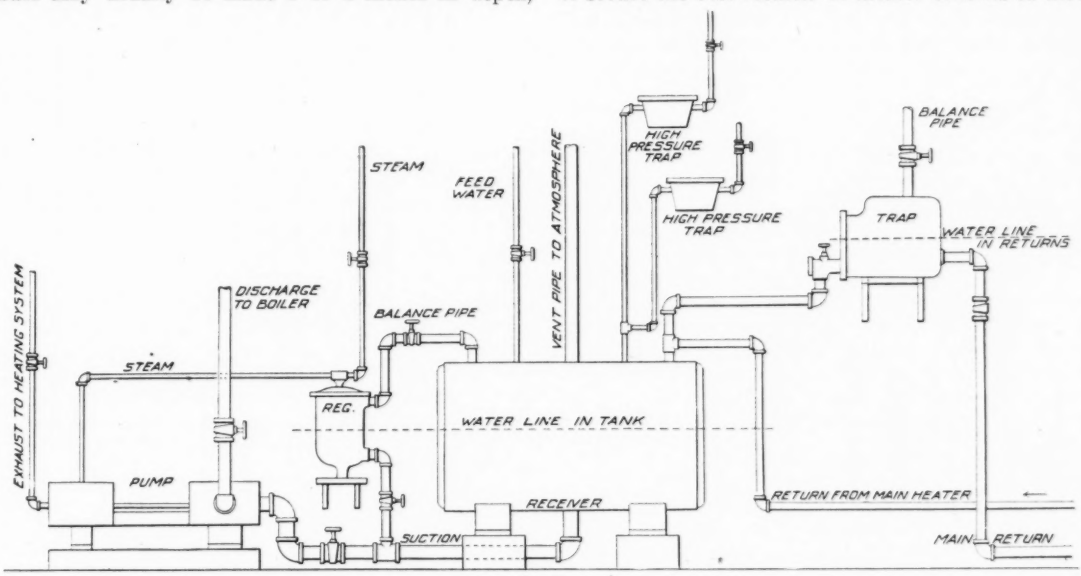

Fig. 35.

the body of the house, or auditorium; the stage and dressing-rooms; and the foyer, lobbies, corridors, stairways and offices. Theaters are usually located in cities, and surrounded with other buildings on two or more sides, thus allowing no direct connection by windows with the external air; and for this reason artificial means are necessary for providing suitable ventilation, and a forced circulation by means of a fan is the only satisfactory means of accomplishing this. It is usually advisable to create a slight excess of pressure in the auditorium, in order that all openings shall allow for the discharge rather than the inward leakage of air.

The general and most approved method of air distribution is to force it into closed spaces beneath the auditorium and balcony floors, and allow it to discharge upward through small openings among the seats. One of the best methods is through chair-legs of special latticed design, which are placed over suitable openings in the floor; in this way the air is delivered to the room in small streams at a low velocity without drafts or currents. The discharge ventilation should be largely through ceiling vents, and this may be assisted if necessary by the use of ventilating fans. Vent openings should also be provided at the rear

of the balconies either in the wall or ceiling, and these should be connected with an exhaust fan either in the basement or attic, as is most convenient.

The close seating of the occupants produces a large amount of animal heat, which usually increases the temperature from 6 to 10 degrees, or even more; so that in considering a theater once filled and thoroughly warmed it becomes more of a question of cooling than one of warming to produce comfort.

Office Buildings.

This class of buildings may be satisfactorily warmed by direct steam, hot water, or, where ventilation is desired, by the fan system. Probably direct steam is used more frequently than any other system for this purpose. Vacuum systems are well adapted to the conditions usually found in this type of building, as most modern office buildings have their own light and power plants, and the exhaust steam can be thus utilized for heating purposes. The piping may be either single or double. If the former is used, it is better to carry a single main riser to the upper story and run drops to the basement, as by this means the flow of steam and water are in the same direction and much smaller pipes can be used than would be the case if risers were carried from the basement upward. Special provision must be made for the expansion of the risers or

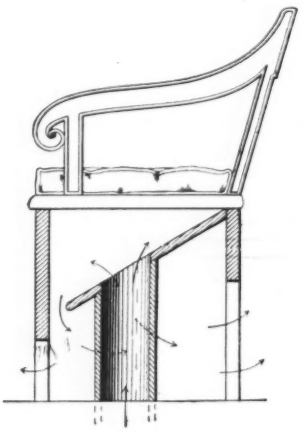

Fig. 36.

drops in tall buildings. They are usually anchored at the center and allowed to expand in both directions. The connections with the radiators must not be so rigid as to cause undue strains or lift the radiators from the floor.

It is customary in most cases to make the connections with the end farthest from the riser; this gives a length of horizontal pipe which has a certain amount of spring, and will care for any vertical movement of the riser which is likely to occur. Forced hot-water circulation is often used in connection with exhaust steam. The water is warmed by the steam in large heaters, similar to feed-water heaters, and circulated through the system by means of centrifugal pumps. This has the usual advantage of hot water over steam, inasmuch as the temperature of the radiators may be regulated to suit the conditions of outside temperature.

Apartment Houses.

These are warmed by furnaces, direct steam and hot water. Furnaces are more often used in the smaller houses, as they are cheaper to install, and require a less skillful attendant to operate them. Steam is probably used more than any other system in blocks of larger size. A well-designed single pipe connection with automatic air valves dripped to the basement is probably the most satisfactory in this class of work. People who are more or less unfamiliar with steam systems are apt to overlook one of the valves in shutting off or turning on steam, and where only one valve is used, the difficulty from this is avoided. Where pet-cock air valves are used they are often left open through carelessness, and the automatic valves, unless dripped, are likely to give more or less trouble.

Greenhouses and Conservatories.

Greenhouses and conservatories are heated in some cases by steam and in others by hot water, some florists preferring one and some the other. Either system, when properly designed and constructed, should give satisfaction, although hot water has its usual advantage of a variable temperature. The methods of piping are in a general way like those already described, and the pipes may be located to run underneath the beds of growing plants or above, as bottom or top heat is desired. The main is generally run near the upper part of the greenhouse and to the furthest extremity in one or more branches, with a pitch upward

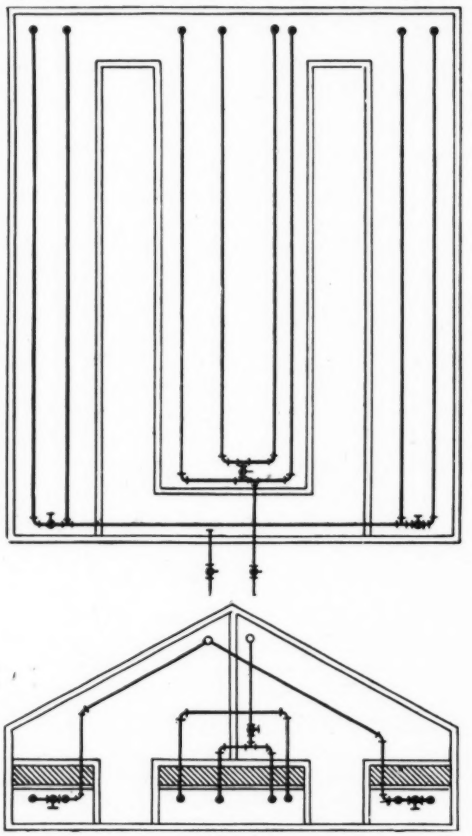

Fig. 37.

from the heater for hot water and with a pitch downward for steam. The principal radiating surface is made of parallel lines of 1½-inch, or larger, pipe, placed under the benches and supplied by the return current. Figs. 37, 38 and 39 show a common method of running the piping in greenhouse work. Fig. 37 shows a plan and elevation of the building with its lines of pipe, and Figs. 38 and 39 give details of the pipe connections of the outer and inner groups of pipes respectively.

Any system of piping which gives free circulation and which is adapted to the local conditions should give satisfactory results. The radiating surface may be computed from the rules already given. As the average greenhouse is composed almost entirely of glass, we may for purposes of calculation consider it such, and if we divide the total exposed surface by 4 we shall get practically the same result as if we assumed a heat loss of 85 B. T. U. per square

foot of surface per hour and an efficiency of 330 B. T. U. for the heating coils; so that we may say in general that the square feet of radiating surface required equals the total exposed surface divided by 4 for steam coils and by 2.5 for hot water. These results should be increased from 10 to 20 per cent for exposed locations.

Care and Management.

The care of furnaces, hot-water heaters and steam boilers has been discussed in connection with the design of these different systems of heating, and need not be re-

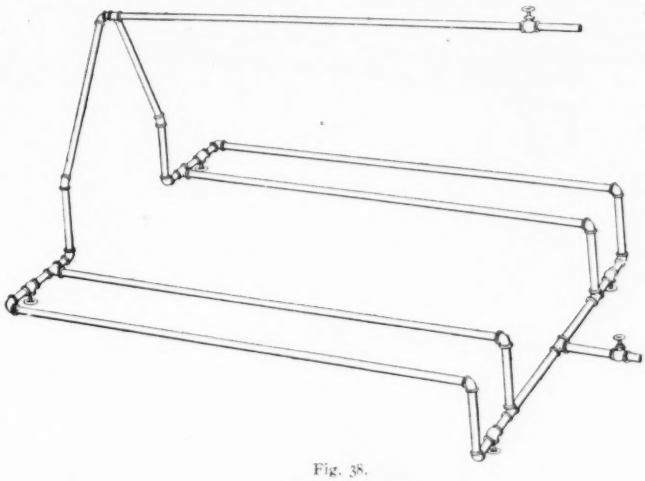

Fig. 38.

peated. The management of the heating and ventilating systems in large school buildings is a matter of much importance, especially in those using a fan system; to obtain the best results as much depends upon the skill of the operating engineer as upon that of the designer.

Beginning in the boiler room, he should exercise special care in the management of his fires, and the instruction given in "Boiler Accessories" should be carefully followed; all flues and smoke passages should be kept clear

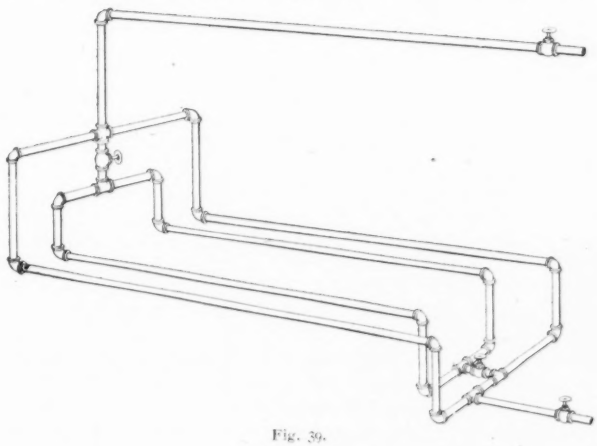

Fig. 39.

and free from accumulations of soot and ashes by means of a brush or steam jet. Pumps and engine should be kept clean and in perfect adjustment, and extra care should be taken when they are in rooms through which the air supply is drawn, or the odor of oil will be carried to the rooms. All steam traps should be examined at regular intervals to see that they are in working order, and upon any sign of trouble they should be taken apart and carefully cleaned.

The air valves on all direct and indirect radiators should be inspected often, and upon the failure of any room to heat properly the air valve should first be looked to as a probable cause of the difficulty. Adjusting dampers should be placed in the base of each flue, so that the flow to each room may be regulated independently. In starting up a new plant the system should be put in proper balance by a suitable adjustment of these dampers, and when once adjusted they should be marked and left in these positions. The temperature of the rooms should never be regulated by closing the inlet registers. These should never be touched unless the room is to be unused for a day or more.

In designing a fan system, provision should be made for "air rotation"; that is, the arrangement should be such that the same air may be taken from the building and passed through the fan and heater continuously. This is usually accomplished by closing the main vent flues and the cold-air inlet to the building, then opening the classroom doors into the corridor ways, and drawing the air down the stairwells to the basement and into the space back of the main heater through doors provided for this purpose. In warming up a building in the morning this should

Fig. 40.

always be practiced until about fifteen minutes before school opens. The vent flues should then be opened, doors into corridors closed, and cold-air inlets opened wide, and the full volume of fresh air taken from out of doors.

At night time the dampers in the main vents should be closed, to prevent the warm air contained in the building from escaping. The fresh air should be delivered to the rooms at a temperature of from 70 to 75 degrees, and this temperature must be obtained by proper use of the shut-off valves, thus running a greater or less number of sections on the main heater. A little experience will show the engineer how many sections to carry for different degrees of outside temperature. A dial thermometer should be placed in the main warm-air duct near the fan, so that the temperature of the air delivered to the rooms can be easily noted.

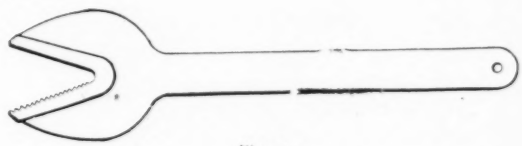

Fig. 41.

The exhaust steam from the engine and pumps should be turned into the main heater; this will supply a greater number of sections in mild weather than in cold, owing to the less rapid condensation.

Steam Fitting.

In order to design a system intelligently the engineer should have some knowledge of the methods of actual construction, the tools used, etc. It is customary, where a piece of work is to be done, to send a supply of pipe and fittings to the building somewhat greater than is required, and the workman after receiving the plans of construction, which show the location and sizes of the various pipes to be erected, makes his own measurements, cuts the pipes to the proper length at the building, threads them and screws them into place.

The tools belonging to this trade consist of tongs or wrenches for screwing the pipe together, cutters for cutting, taps and dies for threading the pipe, and vises for holding it in position while cutting or threading. A great

variety of tongs and wrenches are to be found on the market. For rapid work no tool is superior to the plain tongs (shown in Fig. 40), especially for the smaller sizes of pipe. The alligator wrench (shown in Fig. 41) is used in a similar manner on light work and where the pipes turn easily. For large pipe, chain tongs of some pattern

Fig. 42.

are the best, and may be used with little danger of crushing the pipe. (See Fig. 42.) A form of wrench, known as the Stilson, one form of which is shown in Fig. 43, is widely used. The wrenches or tongs which are used for

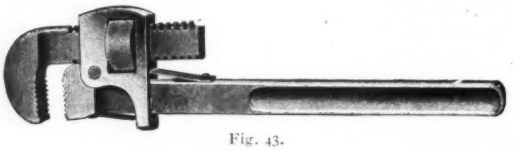

Fig. 43.

turning the pipe, in most cases, exert more or less lateral pressure, and if too great strength is applied at the handles there is a tendency to split the pipe. The cutter ordinarily employed for small pipe consists of one or more sharp-

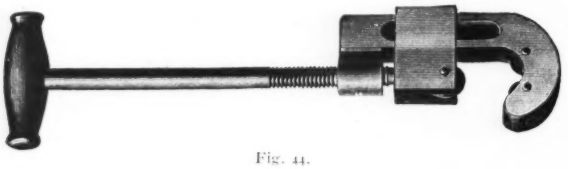

Fig. 44.

edged steel wheels, which are held in an adjustable frame (see Fig. 44); the cutting being performed by applying pressure and revolving it around the pipe. A section of one of the cutting wheels is shown in Fig. 45. With this

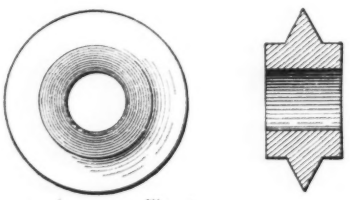

Fig. 45.

tool the cutting is accomplished by simply crowding the metal to one side, and hence burrs of considerable size will be formed on the outside and inside of the pipe. Usually the outside burr must be removed by filing before the pipe

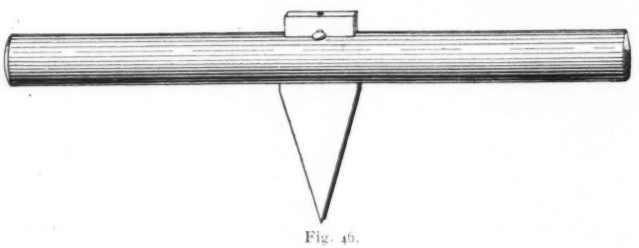

Fig. 46.

can be threaded. The inside burr forms a great obstruction to the flow of steam or water, and should in every case be removed by the use of the reamer. There are many forms of reamers for use in various cases; one of the simplest is shown in Fig. 46.

The ratchet drill is another tool often used, and is especially useful in drilling holes in pipes or fittings after the work is in place. One of these is shown in Fig. 47. A common form of vise used for holding the pipe while cut-

Fig. 47.

ting and threading is shown in Fig. 48. The combination vise is shown in Fig. 49.

The dies for threading the pipes are usually of a solid form, each die fitting into a stock or holder with handles.

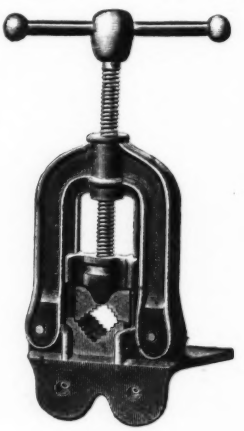

Fig. 48.

(See Fig. 50.) The cutting edges of the dies should be kept very sharp and clean, otherwise perfect threads cannot be cut. In cutting threads on wrought iron pipe, oil should always be used, which will tend to prevent heating and

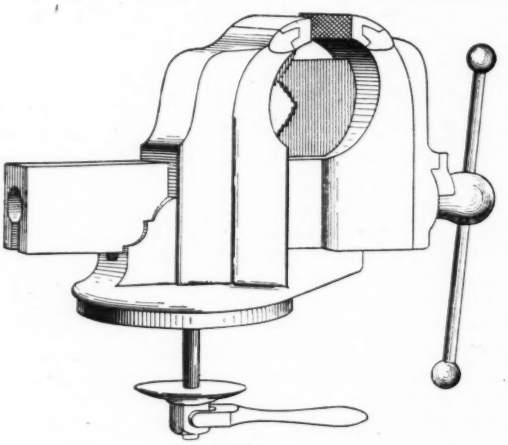

Fig. 49.

crumbling, and make the work easier. In erecting pipe great care should be taken to preserve the proper pitch and alignment, and to appear well the pipes should be screwed together until no threads are in sight. Every joint should

be screwed from 6 to 8 complete turns for sizes 2 inches and under, and from 8 to 12 turns for the larger sizes, otherwise there will be danger of leakage.

In screwing pipes together, red or white lead is often used. It will generally be found that linseed or some good lubricating oil will be equally valuable. If possible, the work should be arranged so that it can be made up with right and left couplings or other fittings.

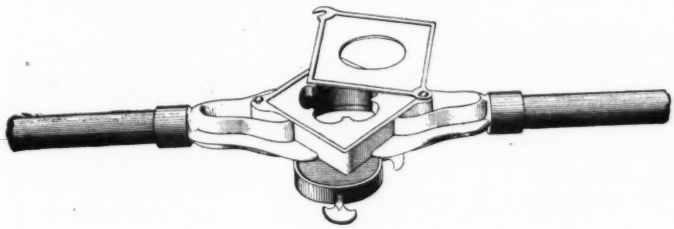

Fig. 50.

Packed joints, especially unions, are objectionable and likely to leak after use. Flange-unions with copper gaskets should be used on heavy work. Good workmanship in pipe-fitting is shown by the perfection with which small details are executed, and poor workmanship in any of the particulars mentioned may defeat the perfect operation of the best designed plant.

SOME POINTS FOR STEAM USERS.

THE following paper on the use of steam is one of a series of very excellent articles prepared by the educational committee of the Canadian Association of Stationary Engineers for the benefit of candidates for engineers' papers who are preparing themselves for examination. Doubtless many of our readers will find it both interesting and instructive as giving in an entertaining manner many points with regard to steam which, while elementary in character, are not fully understood.

Steam is a colorless, expansive, invisible fluid, and is produced by heating water or other liquids.

The subjects of steam and heat are therefore very closely connected. We cannot have steam without heat, neither can we have heat without motion, and this is one of its great factors of usefulness to mankind. Our steam engines then are in reality heat engines, and the steam is the medium by which the heat is carried from the coal to completed work at the engine cylinder. We say steam is an expansive fluid: and in this expansion is its great factor of usefulness to us. If we take water at 32 degrees F., and add 180 heat units to it, under our atmospheric pressure it boils, and its temperature is 212 degrees F. Up to this point we can measure the heat with a thermometer; this is called the sensible heat of steam. We also have what is called the latent (or lost) heat of steam; this cannot be measured by the thermometer and comes about in the following manner:

If we take one pound of water at 32 degrees F. and apply a fixed and known quantity of heat to it until it boils, we will assume that it takes 20 minutes, and we have supplied the water 180 heat units, which added to the 32 contained in the water at the start makes 212 degrees F. or heat units, and is the sensible heat of steam at atmospheric pressure. Now let us continue the same quantity of heat per minute until all the water has evaporated into steam, we will find it has taken 5 1-3 times as long, or 107 minutes, to do this work. Consequently we have used 5 1-3 times 180, or 960 heat units; or, to be exact, it is 966 heat units. Now the temperature of the steam is the same as the water from which it was evaporated, or 212 degrees F.,and this 966 heat units is the latent heat of steam at atmospheric pressure. All steam has a sensible heat corresponding with the temperature of the water it is evaporated from. If you boil water under a pressure of 5 atmospheres or 75 pounds pressure, the sensible heat is 306 degrees F., the boiling point at that pressure, but the latent heat has decreased by the same number of heat units that the boiling point increased, so the total is the same in all cases. In the first case we have 212 degrees minus 32 plus 966 or 1146, and in the second case, 306 degrees minus 32 plus 872 equal the same 1146 heat units.

In evaporating our pound of water under atmospheric pressure, the temperature remained at 212 degrees, but the volume was increased to 1644 times that of the water in the second case; evaporating under 75 pounds pressure the temperature also remained the same, 306 degrees F., but the volume is only 295 times that of the water it was evaporated from. This is one of the reasons it pays to run an automatic cut-off engine.

The expansion of steam follows what is called Marriott's law of expanding gases, which summed up means one-half the pressure doubles the volume. So if we let steam into an engine cylinder at 80 pounds pressure, and cut it off at one-fourth stroke, it is at 80 pounds up to the point of cut off; at one-half stroke, because it has doubled its volume, it is reduced to one-half pressure, or 40 pounds; while at three-fourths stroke the volume has trebled and the pressure has dropped to nearly 27 pounds, and this is why it is economical to run engines that use steam expansively. Steam at 27 pounds pressure is very much cooler than steam at 80 pounds, and this difference in its temperature has been converted into mechanical work by our steam (heat) engine.

Of the latent heat that disappears in the formation of the steam we can recover a great part of it again when steam returns to water, that is, it gives up its latent heat when condensed. That is one reason why steam is a good medium to heat our buildings, and also a good reason why it requires so much cold water to condense the steam back to water quickly as in an engine condenser. Steam also has a very rapid movement. It will flow under a pressure of one and one-half atmospheres into the air at a velocity of 67,500 feet per minute, and into a vacuum from a pressure of one atmosphere at the rate of 114,540 feet per minute, or 1,242 feet per second. This is why a steam pipe and the steam ports of a cylinder may have a very much smaller area than the piston itself, and the rate of flow of steam in pipes is how their sizes are determined. The whole science of the intelligent use of steam is to save, utilize and direct its heat, the more of which we can capture and harness the more money we can save for our employers. The whole success in steam engineering is to stop heat wastes, and the man who can accomplish that the best, is the man with the big salary every time.

All engineers should carefully study the use of exhaust steam. Very nearly nine-tenths of all the heat in the steam escapes into the atmosphere from an ordinary engine running non-condensing, and any of this heat that can be put to good use is clear gain. One of the first uses to put the steam to is the heating of feed water for the boiler; another is to heat water for any other purpose about the building or factory. Still another is to heat dry kilns of different kinds, and also the heating of the buildings. All of these things can be accomplished without adding more than one or two pounds to the atmospheric pressure, against which all non-condensing engine pistons move. In the heating of feed water each 10 degrees F. added to it will save 1 per cent. of fuel—and if your feed water enters the boiler at say 40 degrees F., and you bring it up to 212 degrees F. by the use of exhaust steam, you have still left in the steam 966 minus 212 equals 744 heat units that may be used for other purposes. In heating your feed water from 40 to 212

degrees you have only condensed two-elevenths of the steam used for that purpose. An economical 80 h. p. automatic cut-off engine using 30 pounds steam per h. p. per hour, and discharging into the atmosphere at a back pressure of one pound per square inch, will discharge heat enough to supply 9,000 square feet of radiating surface, or enough to heat a building containing 720,000 cubic feet of space.

What per cent. of fuel will you gain if you heat the feed water from 60 degrees to 210 degrees by the exhaust steam or waste heat, the steam pressure being 60 pounds?

By your steam tables you will find your sensible heat of steam at 60 pounds pressure to be 30.7, and the latent heat will be 899, making the total heat units 307 plus 899 equals 1,206. The total heat supplied per pound of steam is 1,206 minus 60 equals 1,146; but the feed water increases in temperature from 60 to 210, a gain in heat of 150 degrees.

$$\text{Therefore we have} \frac{150\times100}{1,146} = 13.86 \text{ per cent.}$$

RULE. Divide 100 times the difference between the final and the initial temperatures by the total heat units in the steam, minus the initial temperature of the feed water; or the formula will be thus:

Final temp. of feed—initial temp. of feed.

Total heat units in steam—initial temp. of feed water.

Example.—Initial temperature of feed water is 45 degrees, final temperature 210 degrees, steam pressure 100 pounds gauge. Find the gain. Ans.—14.1 per cent.

Fire Hazards of Heating Systems.

THE great diversity of devices and methods in use for house warming, due to the varying conditions of fuel supply and climatic requirements, presents to the underwriter a range of fire hazards which compels the careful study of all the conditions to enable him to suggest to the user the proper safeguards to prevent disaster.

The surveyor or inspector finds his attention called to problems ranging from the old-fashioned open fireplace, with wood for fuel, such as grace and make cheerful our country homes, to the wood or coal-burning stove, and up to the more modern and complicated steam, hot-water and hot-air furnaces, now so common in the equipment of city and town houses, with a sprinkling of natural gas grates or stoves, and an occasional encounter with the kerosene-oil device, each demanding special expert knowledge as to construction and use, and the exercise of good judgment in the suggestions necessary to make safe such defects as may be discovered upon investigation.

Statistics of fire losses from heating appliances seem to place stoves and stove pipes at the head of the list, followed closely by hot-air and indirect steam-heating devices; then in regular order, open fires, wood and coal, hot water and direct steam heat, oil stoves, and last, natural gas. Considering the record of fires from heating apparatus as a whole, the only conclusion to be reached is that carelessness is at the base of each of these accidents, either as a defect in the original installation of the apparatus or as the result of recklessness and the neglect in its after use and care. With a desire to consider briefly some of the salient points of hazard incident to the methods of house warming, we take up the different devices in the sequence of the statistical record as above noted.

Stoves and Stove Pipes.

Where such devices are to be used for heating or cooking they should be free from cracks or other imperfections which would admit of the escape of coals or sparks; should be set upon solid platforms of brick, or in metal pans with raised sides and legs 3 inches in height, in either case being large enough to extend well in front of the ash pit and thus protect the floor. Stoves should not be set within 18 inches, nor their pipes within 10 inches, of any woodwork, lath or plaster partition or other combustible material, except when conditions will not permit otherwise, and then all combustible material should be protected with bright tin sheeting, with a space of not less than 0.5 inch between it and the combustible.

Stove pipes should be well and frequently supported by wire; each joint should overlap the other toward the stove and be carefully riveted to prevent the escape of sparks. Fires should not be dumped into the ash pit, except upon a bed of dead ashes of not less than 2 inches in thickness. All pipes should enter the chimney or flue horizontally and in plain sight. Pipes entering flues vertically, or passing through blind or unused attics, where they may not be frequently inspected, are prolific causes of fires, particularly in country houses.

Hot-Air and Indirect Steam Heating.

The furnace should be set upon a very solid foundation in order to prevent the sagging or cracking of its walls. The top or dome of the enveloping walls should not be less than 18 inches from the unprotected woodwork or lath and plaster ceilings, and its smoke pipe or flue should be a like distance from combustibles. The ash pit should be sunken, or the floor in front of it be of brick, stone or concrete, not less than 36 inches wide. The inclosing walls of the furnace should not be less than 12 inches from all combustible material, and the inlet or cold-air duct should be entirely of iron or other metal.

Hot-air flues or conduits should be made of heavy, bright tin plates with well soldered lock seams, and be kept at

THE WONDERFUL
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A Short Talk on Store Lighting
Good store light is a neccessity—not a luxury. The well-lighted store is the cheerful store, and the cheerful store is most generally the well-patronized store.
Nobody knows these things better than the gas and electric companies—and they charge you accordingly.
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"Doran Lights" give a stronger, steadier, whiter light than the electric arc and cost only one-tenth as much to maintain. Their safety is beyond question. Our safety devices absolutely prohibit the introduction of more than one gallon of gasoline into the building at one time.
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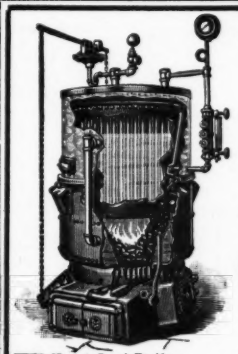
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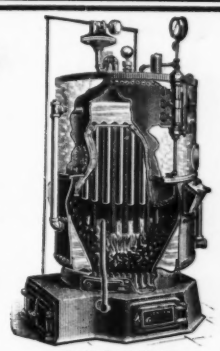

Soft Coal Boiler

least 10 inches from all woodwork or other combustibles. Where it is necessary to carry them through or into wooden or lath and plaster partitions, the flues should be double; *i. e.*, one inside the other, with an air space of not less than 0.5 inch between the two, and be properly braced to insure rigid separation throughout. Where register boxes are set in floors or partitions, the woodwork should be framed around them to leave an air space of not less than 2.5 inches and be protected by flashings of bright tin extending from the outer edge of the register opening to and through the floor beams or partition. Each register should be set in a frame of soapstone not less than 2.5 inches wide and 1 inch thick, firmly and well set in cement or plaster of paris.

Hot-Water and Direct Steam Heating.

The same general care in setting and arrangement should be followed as suggested under the item on hot-air and indirect steam-heating devices, and in addition all pipes used for the conveyance of hot water or steam should be kept free from contact with woodwork or other combustibles by the use of metal thimbles or sleeves, provided with interior lugs or radial points, to provide an air space where the pipes pass through floors or partitions. Fires from hot-water systems occur from the high temperature reached by the water on account of obstructions or retardation of circulation in the pipe system, whereby the heat generated is sufficient to cause the ignition of the wood or other combustible material already partially carbonized by long-continued high temperatures. Similar dangers attend the use of direct steam heat, and are augmented by the possibility of the superheating of the steam in the boiler, owing to low water.

Oil Stoves.

The fire record of these devices is largely out of proportion to the number in use for heating purposes, and the only practical method of eliminating the hazard of their presence appears to be that of entire prohibition, as even under the most favorable conditions of use they have proven extremely dangerous.

Natural Gas.

Heating by this means is restricted to limited areas of the country, and when the supply is sufficient to insure a full supply at constant pressure, the hazards of its use are quite mild, provided the piping has been properly installed and has passed a rigid test for leaks, and the flues for carrying off the products of combustion have been constructed for the purpose. When, however, the supply is weak and restricted, and the consequent pressure variable, the hazard of its use is vastly augmented, for with low pressure and small supply the user is inclined to open the valve in the supply pipe to its fullest extent in order to secure a good blaze; and when, later, the pressure is increased from any cause, the small blaze is turned into one of great intensity and power, and is liable to ignite combustibles at a distance.

The only practical means of reducing this hazard lies in the use of an automatic high and low-pressure regulating valve in the main supply pipe, whereby the flow of gas will be automatically cut off when the pressure either rises above or falls materially below normal, at which it is set to act. Such controlling devices are open to purchase in the districts where natural gas is a factor, and the use of the same should be made obligatory.—*Insurance Engineering.*

IN Schools and Colleges, owing to the absolute neccessity of renewing the air to insure healthful conditions, they require a system of heat-regulation that is accurate. Failing in this respect the result invariably is sickly students and staff.

Much attention has been given to school heating and ventilation. with the following results: Where heating has been accomplished it has beeen accomplished at the expense of ventilation, and ventilation at the expense of heat and fuel. A perfect combination had never been devised.

Under the "Nash" Patents we are enabled to install a Temperature Regulating System that is absolutely reliable—never too hot, never too cold, with a perfect ventilation.

Write for booklet "Comfortable Economy"

The **Nash Regulating Valve Co.**
Detroit, Mich.

Acetylene Possibilities at the Louisiana Purchase Exposition.

By A. E. Schlieder.

Read before the Annual Convention of the International Acetylene Association held at Chicago, August 11-13, 1902.

Gentlemen: It seems only fair to warn you at the beginning that an error has been committed, but some one has said that "to err is but human," therefore deal not too harshly with your committee on program who wilfully brought this calamity upon you by seeking out a very meek and lowly acetylene promoter from Omaha, Neb., and probably reasoning that since he hailed from a great state, and lived among a great people, he must of necessity be a great authority on acetylene possibilities. Having thus decided, they proceeded fortwith to disturb the even tenor of his way by abruptly, and without warning, commanding him to prepare and come before this body of intelligent benefactors of humanity to read a paper. How greatly your committee has erred in assigning the subject of Acetylene Possibilities at the Louisiana Purchase Exposition to me, you will realize long before I am through.

About one hundred years ago, President Jefferson purchased from the French nation, for the people of the United States, an immense tract of land now comprising several states of the Union; to commemorate this transaction it has been decided to hold a grand Exposition at St. Louis, Missouri, in 1904.

It is intended that this coming Exposition shall eclipse all former efforts in this line, especially is it proposed to make the illumination of the grounds and buildings the grandest spectacle ever witnessed by human eyes, and no doubt it will well repay any sacrifice necessary to go to the Exposition if only to see the illumination, which we are promised shall be one of its many interesting features.

The acetylene possibilities at this coming Exposition are largely dependent upon the amount of practical interest taken, and the assistance rendered by the management of the Exposition itself, as well as upon the amount of money, energy, and intelligently directed effort put into the enterprise by acetylene interests.

The magnificent, stately building, beautifully, brilliantly, yea, perfectly illuminated with acetylene, in which were displayed practical, comprehensive exhibits of the acetylene industry at the Pan-American Exposition at Buffalo last year, will long remain a bright spot in the memory of all who saw it (excepting, possibly, our competitors), as well as a lasting monument to the energy and ability of those who conceived and carried to a successful termination that magnificent enterprise, which was truly a revelation to thousands, including not a few who were already somewhat familiar with the illuminating value of acetylene.

The acetylene building, the carbide producing furnace, the generating apparatus, the burner and portable lamp displays, were all excellent and creditable for 1901, but the possibilities for 1904 are greater than they were in 1901, and we must surpass the Buffalo Acetylene exhibit, or it would seem as if we were not progressing; and here, the question arises, how shall this be done?

Among the many suggestions which present themselves are a larger, more imposing acetylene building, with the lights outside and inside multiplied, with more space for individual exhibits.

It should be possible to secure enough exhibits to occupy every available foot of space in this building with displays from the different lines in the acetylene industry; not a foot of space should be allowed to remain vacant. A well filled building always creates a more favorable impression than one with vacant spaces, especially when the exhibits are all of the same nature. To secure this result it might be possible to make the price charged for space nominal, as making an exhibit at a large exposition is expensive at the best, and many manufacturers argue that the benefits derived do not justify the outlay necessary to make a creditable exhibit.

Exhibits are most interesting and instructive when they are installed as live exhibits; that is, that they be set up so they can be operated, thus demonstrating in a practical way what may be expected from them when installed on the user's premises.

Generating apparatus especially should be installed so that the process of producing acetylene may be illustrated, while the theory is being explained. Many persons are slow to grasp the idea from mere explanation, and it has happened that after the operation of a generator and the philosophy of producing acetylene has been minutely explained, one of the careful listeners has asked, "Where did you say you put the gasoline?"

Comprehensive exhibits of portable house lamps, buggy lamps, miners' lamps and railroad lanterns should be made, as all these help to educate the public to the intrinsic value of acetylene. In my home city the gas company use acetylene lamps to read their meters by; thus even our competitors use acetylene in dark places, where they think no one is looking at them.

Railroad companies are constantly experimenting to find suitable apparatus for engine headlights and coach lighting. A satisfactory exhibit along this line would attract no small amount of interest from railroad men; here is a large field for acetylene endeavor practically untouched.

Acetylene stove exhibits should demonstrate that acetylene is practical for fuel purposes. Many gasoline plants are sold to people who would buy acetylene plants were they not positively informed by the gasoline man that their acetylene range will surely go wrong, explode, demolish everything in sight, and retire the cook from future usefulness,—surely a dreadful calamity.

Our friends, the acetylene range manufacturers, might enter into a partnership with some promoter of a new brand of flour, or a new cereal, which they are anxious to demonstrate, and prepare the samples on an acetylene stove, and distribute it to the public with a souvenir stating that the bun was baked by acetylene heat. This would have the merit of being popular, as few people will refuse samples of anything that is good to eat.

One of the hard things in demonstrating acetylene is to convince the average man that a one-half foot acetylene burner gives as much light as his 16-candle-power electric incandescent lamp, and when you tell him that it gives one-third more light than his electric lamp, he is apt to intimate that you are taking liberties with his intelligence.

It would be possible to arrange an exhibit of acetylene and electric incandescent lights in an otherwise dark room in such a way that the two would light and extinguish alternately, each five seconds; arrange the two so that the cost per hour would be the same for one as for the other. In this way we might convince our skeptical friends of the truth of our assertions and of the superiority of acetylene, because there would be a fully developed eclipse in that room every alternate five seconds.

There will be many possibilities on the grounds away from the acetylene building. All the entrances to the grounds might be lighted with acetylene. These lights ought to be fitted with electric spark igniters and arranged so they will spell out the word Acetylene, thus apprising every one entering the grounds that acetylene is staring them in the face, and is not ashamed of it, either.

Another possibility is an Acetylene tower (perhaps not so elaborate as the Pan American Exposition Electrical Tower). This might be located in a prominent place on the grounds and fitted with a large number of acetylene lights; this would show by contrast the difference in the color and power of acetylene and electric light. It would also create a favorable impression on occasions when the power plant goes wrong and the electric lights go out of business, leaving the grounds and visitors in darkness.

An ordinary eight or ten-room dwelling might be provided in which to entertain our friends. This should be neatly and comfortably furnished and liberally supplied with papers and magazines. It should be lighted with acetylene and provided with an acetylene range, so a complete outfit could be shown. This would assist greatly in creating a demand for acetylene in private homes.

The Fine Arts Building ought to be illuminated with acetylene, as this light is especially adapted to reveal the Beautiful.

It ought to be employed where the desire is to bring out the skillfully drawn lines, the delicate and harmoniously-blended colors.

One of the popular ways to demonstrate acetylene is to light up state buildings. Would it not be possible to get the privilege to light up a group of such buildings located reasonably close together? The gas could be supplied from a central plant. The surroundings of these buildings might be lighted with acetylene street lamps, installed on lamp posts or swung from wires like electric arc lamps. An exhibit like this would fully illustrate acetylene municipal lighting, a subject which is being earnestly discussed by many of the smaller towns. Here is a practical field which has not been worked very hard as yet.

These are respectfully submitted as a few of the Acetylene Possibilities at the Louisiana Purchase Exposition. Because of the hurry necessary in preparing this paper it is quite likely that the best and most important ones were entirely overlooked and omitted, for there is practically no limit to the possibilities of acetylene in the lighting field, and (using its competitors as stepping-stones), until it stands at the very head and is universally acknowledged the queen of light, worthy of the world's profoundest respect.

Acetylene Town Lighting from Automatic Generators.

By W. W. Turner, Chicago.

Read before the Annual Convention of the International Acetylene Association, held at Chicago, August 11-13, 1902.

(Subject to Copyright.)

Power produced by generating acetylene in a water sealed chamber has made possible the part automatic and the automatic apparatus for supplying this superior illuminating gas from calcium carbide.

The mechanical construction necessary to perfect such an apparatus carries with it, necessarily from its proportion, a pressure.

This pressure or repellant power exists, to a degree approximately determined, in all styles of such generators and is an acceptable feature, as it is found serviceable, and is necessary to force the gas through the generator parts, and to points of consumption, if not for operating service.

Gravitation provides the attractive power necessary for feeding the carbide and water into the generator and to cause a flow of residuum from the generator, leaving the repellant power to apply such mechanical devices as are necessary to control the ingress of carbide and water and the egress of residue, adding force to the operation if required, and to force the gas through different operating parts into the gas holder.

The proper application of power has been chief among inventive problems for centuries, and is today a problem unlimited in its analysis, from the youthful realization of stern paternal application to the end of man's industrial career.

When steam pressure was found applicable as a power, it was but a step to apply this power to the automatic injection of water into the steam generator, from which to make more steam.

And another stride onward to apply the unspent power of escaping steam by low pressure device, thus extracting and applying from this great force all possible power.

The dropping of water, we are told, will in time wear away stone, but time is in its flight and we can use the stone, also the water, with better results. So man is wont to arrest the water that has a good opportunity to drop; to retain and use the power it produces in dropping.

In preference to cheapness at first cost water power is a luxury, but great economy is realized in its simple application and the small amount of labor and expense attending its operation.

How we obtain the pressure in an acetylene generator is well understood, requiring no argument.

We have the pressure power inherent or intrinsic and have the opportunity to use it. Have we sufficient power? Can we make the application in harmony with the desired and required uniform action of the parts of a large generator?

We are permitted a pressure of about 60 tenths water column on insured generators not requiring pressure regulators, and on generators of heavy construction, equipped with pressure regulators, the insurance interests permit a pressure of about 720 tenths, W. C.

Necessary pressure at the gas holder will require about 28 to 30 tenths W. C. (including 10 tenths W. C. for variation of pressure in operating).

Reckoning 10 to 20 tenths W. C. for transmission through the customary water seals and auxiliary regulators—if any—and 10 to 20 tenths W. C. to operate a residue discharge—if any—we have 20 to 40 tenths W. C. to operate a feed or other device from pressure in the generating chamber.

But the usual method of operating the feeding device by the rise and fall of the gas holder, requiring 2 to 10 tenths W. C. P., including friction, allows a surplus pressure of 20 to 40 tenths W. C. P. on a low pressure system without regulators, or 680 to 700 tenths W. C. P. with regulators.

With inherent power equal to all necessary operating requirements, and an excess permitted and waiting our command, there is no chance for failure, except in the application.

Of all automatic apparatus and appliances brought before the public for their approval, from time to time, the Automatic Acetylene Generating Apparatus appears to be the most unique and peculiarly applicable.

In the comparatively few years this great lighting system has been a subject of research by the scientist and mechanical geniuses it is certainly a most flattering testimonial to the self-operating generator to have issued from a prominent body of proficient engineers, schooled and practiced in theoretical and practical mechanism, the command: "Generators of less than 300 lights capacity *must be* automatic in operation."

We are also encouraged by the rapid adoption of automatic devices by new manufacturers and an occasional conversion in high places.

With natural forces applied and mechanical problems solved, does it really constitute a vexed question to adopt this apparatus, so well executed in theoretical and practical detail, to the responsible duty of village, town or city lighting?

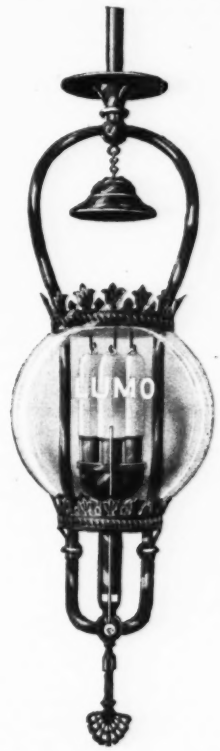
With one inch W. C. pressure, equalling the greater fraction of one ounce per square inch pressure power, the multiple of one square inch of surface pressure multiplies that pressure power.

Does not the larger cylindrical float or chamber, operating in a water seal, respond to this power with less violence and the same degree of certainty as the small cylindral float or chamber?

With the assistance of gravity pressure in proportion to the larger sizes, we have less friction proportionately.

Does not the action of a larger feeding device, the transmission of gas, the residum discharge or auxiliary floats and regulators in larger proportions require the same or less proportionate power compared with the smaller?

The Lumo Triple Arc



The cut herein shown is the only explanation necessary. The beauty of the fixture, together with the brilliancy and cheapness of operation is what does the talking. The Triple Arc is equal in candle power to any gas arc lamp upon the market, and will only consume from 9½ to 10 feet of gas per hour.

The construction of the fixture is simplicity itself, and there is absolutely nothing to get out of order. In fact, we guarantee them to be satisfactory in every particular. We will send a sample lamp on thirty days' trial to any gas company.

Acorn Brass Mfg. Co.

199 Fulton St., Chicago, Ill.

Is not the operating expense of a self-operating apparatus less than one requiring man power or auxiliary power?

Is not a comparatively small body of gas stored in a community less hazardous than a large body of gas?

Is not a machine properly constructed and subject to the most rigid tests before being approved, more accurate and fully as reliable as the average auxiliary power or operator or man power?

Is not the economic system more desirable to investors than the more extravagant system?

These conditions and questions are of interest to the trade, as well as to the patrons, and with proper respect for the comments can only be answered in the affirmative.

The camel is a power for transportation over the arid wastes of Africa; its storage capacity is abnormal and appreciated on the desert of Sahara, but as a rapid transit or transportation medium, its ungainly bulk has been superseded.

Large storage capacity may be a good feature on the great Sahara, but it is necessary, by providing large storage, to increase the hazard and expense of an acetylene gas plant in a country where the desert of development and invention is a garden of luxurious growth.

A machine or apparatus of this character is valuable according to its capacity for producing, not retaining.

The more compact you construct, the easier you can operate.

Easy operation, compactness and greater producing capacity add value and lessen proportionate expense.

The quantity of carbide consumed is the same, the quantity of residue is the same, the quantity of gas produced is the same, the quality of gas is about the same—if any allowance for deterioration in storage is allowed, the fresh gas from the automatic process is entitled to the preference.

The quantity of water used in the storage system is greater, by reason of the rapid operation in generating, and the quantity of gas absorbed and carried away is greater by reason of the residue being carried through in an unsettled state, or if a settling box is used, the greater amount of gas absorbed in the clear water is carried away with its discharge.

But other points allowed as equal, in actual capacity for supplying 1,000 24 C. P. burners in time reckoning, the automatic system is double the capacity of the non-automatic.

In operating a carbide feeding device it is desirable and necessary that a predetermined quantity of carbide shall drop into the water at a given period of operation.

We find inventors of carbide-feed generators experience little difficulty in arranging the precision of the operation as to time, and several have solved the measurement of quantity with marked accuracy, assuring to the most skeptical of an automatic device that will (and does) feed a given quantity of carbide from a carbide chamber into a generating chamber more accurately as to time and quantity than the human hand could well perform the same operation.

When the carbide feed device was introduced the manufacturers of carbide favored the innovation, as it used a size material necessarily produced and for which there was little demand, but the progress of the system was so rapid that the same manufacturers find it necessary to produce a larger percentage of this size than was realized in the regular order of things, and now the inventor of feeding device is required to meeta demand for feeding a larger size carbide in the large generators; also to successfully operate a 1 to 10 or 20-pound charge with the same accuracy and relatively less power for the larger amounts, which demand is being promptly met.

A 1,000 light automatic plant when in full operation should feed carbide into the generating chamber at about three-minute intervals, and not more rapid than one-minute intervals, using the larger carbide; or 2 minute to ½-minute intervals, operating with the smaller carbide. The gas holder can then be relied upon for positive operation of the feeding device, and proper disintegration of the carbide is assured.

To prevent overheating in generation it is necessary to supply a large body of water in the generating chamber, or displace a regulated quantity of residuum and supply a corresponding quantity of fresh water to replace the quantity of residuum discharged.

The part automatic generator operates with the large body of water, which should equal, according to Prof's. Moissan, Lewes and others, a ratio of 100 gallons of water for each 100 lbs. of carbide, operating a 100-light generator, if properly rated, about 9 hours.

The complete automatic generator should operate to displace about 60 gallons of residum and supply about 60 gallons of fresh water for each 100 lbs. of carbide consumed, operating a 100-light generator, if properly rated, about 9 hours.

The latter system, supplying fresh, cool water at the high temperature point after each operation, requires a less proportionate quantity of water to preserve low temperature in generating.

A body of water exposed to the contact of gas under pressure allows in all styles of generators a quantity of gas to be absorbed and carried away in proportion to the amount and consistency of the refuse discharged. The contact of a large body of carbide and a small body of water tends to produce impure acetylene.

The proper proportions of carbide and water coming in contact tend to produce pure acetylene.

(To produce a dry residue and impure gas is equivalent in economy to cutting away from each end of solid timber to save waste and lumber; you have smaller blocks and more saw-dust.)

Hence to produce the best quality of gas the greater quantity of residue is formed, and in discharging the whole of this hydroxide of lime, the absorbed gas is carried away; and it is only by disposing of the less gasified portion and retaining the other, that the two results: best quality of gas and the least waste of gas can be accomplished.

This residuum discharge feature in an automatic cleaning generator system has suffered to a limited extent from a misunderstanding, misapprehension or misrepresentation; and as three misses by the old thumb rule would make three miles, it is fair to presume that all have been responsible for some deductions that are offered, which are certainly three miles or more from a correct analysis.

An automatic residuum discharge should be from the low point in a generating chamber, where the heavier matter—lime and uncombined coke—which absorbs a lesser quantity of gas, collects. By discharging small, regulated quantities of this heavier portion at intervals, the lime and water mixture above the point of discharge is maintained at much lighter consistency; and it is in this lighter body that the greater percentage of gas is absorbed and retained, while the less gasified residue is discharged from the base at intervals as it collects.

It was my pleasure to meet a committee of intelligent men (the committee) to discuss acetylene versus electricity for town lighting. The first, and apparently the great question to solve was the clogging of the mains. Not realizing the importance this subject had been allowed to assume, the question was answered in true Yankee fashion, by asking how a gas, scrubbed, dried and chemically cleansed, if so desired, could clog a pipe by depositing in the pipe a substance the gas did not contain.

But the question would not down so easily, and after producing all possible and probable facts and theories to a good percentage of the population, I was introduced to the original dispenser of the theory, who finally quoted as his authority my competitor, the electrician, who knew of an acetylene plant that had been in operation but 10 years when the pipes were all clogged up; and my friend was much surprised to know that 8 years antedated the arrival of the original acetylene town plant. Moral: Don't allow the electrician to "clog your pipes."

With the surplus power permissible, improved devices for cleansing, purifying and regulating the gas supply can be operated in an automatic generator, if further experience prove it necessary, but the gas produced and held in the holder of the modern automatic apparatus has proven pure and free, equal or superior to that furnished by the storage settling system.

It is but a few years since the dairy man consumed hours of fleeting time in separating the cream from the milk, by a settling process, where now a few seconds in the mad whirl of the separator jerks the butter fat from the original cheese and butter composition.

The separation of deleterious matter from the pure gas is performed in the simple operation of passing the gas through and through cleansing and purifying process on its way to the gas holder, where it arrives free from any sediment that could possibly clog a piping system, and if the pipes are clean, will not clog the orifice of any well constructed burner.

The detail in estimating a town plant is not the complicated task it may appear to be. A basis for estimating every requirement, the locating and housing of the generator, the selection of a generator (advice on this point may even be insisted upon), the trenching, piping, street lighting, etc., etc., are plainly defined by a number of companies who will furnish estimates covering the entire enterprise from the favorable decision of the municipal "Fathers" to the completion of the system and the application of the match.

The original cost of a Municipal or Mutual Lighting Plant can be composed in three divisions: building, constructing and the producing apparatus.

For a coal oil or water system in towns of 500 to 10,000 population, the proportionate cost, as compared with acetylene, is so high as to be practically prohibitive.

For an electric plant on the same scale, each division of cost is higher and collectively the first cost exceeds that of acetylene of equal candle power and efficiency by 20 to 50 per cent.

A gasoline vapor plant, with its certain uncertainty of quantity and quality, and impossible regulation in illuminating power, with its certain clogging of pipes and burners by deposits of foreign matter, with its ever present noxious fumes and air vitiation and hazard in handling, is more expensive in original cost than acetylene.

In operating and maintaining this system it requires no expert attendance, no continuous repairing or renewing of vital parts, no annoyance or expense of delicately constructed lamps or burners, no auxiliary power with its attending expense and probable mishaps, no material or product of increasing cost (but rather a supply product of decreasing cost).

It passes the man with the hoe and brings you up to the 20th century standard of economic lighting systems.

With the installment of a town lighting system, an automatic generator will perform the functions required with the precision of the town clock. In applying the power to the working parts, there must be a degree of certainty as to the results. The action of one part is dependent upon the action of the other; the operation of one part compels the operation of the other; and while the source of power is maintained, calcium carbide and a complete automatic generating system will continue to grow in popularity and be responsible for hundreds of enterprising towns and villages dispelling darkness with the sun-like rays of Acetylene Illumination.

Greater New York

Office: 89-91 Centre Street Tel. Franklin 1680

ELMER CRAWFORD, Gen'l Manager. Gilbert G. McDuff, David G. Baillie } Representatives

Manhattan and the Bronx.

DuBois's War Cry.

F. N. DuBois & Co. announce "lead pipe, lead traps, bends and drum traps, combination bends and lead ferrules," at their headquarters, No. 245 Ninth avenue.

Warranted Not to Crack.

The Herendeen Mfg. Co., of Geneva, N. Y., advertise the fact (which may be easily proved) that the Furman new sectional boiler is warranted not to crack. This virtue is a high recommendation.

McLain's Predilection.

Frank C. McLain, of No. 1123 Broadway, New York, says that he would rather advertize in Domestic Engineering than in any other paper. He is not a spiritualist; but he knows a good medium when he sees one.

Vogel's Vogue.

At No. 1518 First avenue, New York, "way up town," between Seventy-ninth and Eightieth streets, is the Yorkville Plumbers' Supply Depot, owned by Ig. Vogel. Mr. Vogel is in vogue in his brisk and bristling neighborhood.

John Boyd.

John Boyd, steam, hot water and plumbing contractor, has secured a contract in connection with the Connecticut Mutual Life Building. This is a plumbing contract in addition to what has been already completed. Contract amounts to over $75,000.

Urquhart's Line of Supplies.

Mill, gas and steam fitters' supplies, for which there is a constant demand all the year round, are manufactured, in every variety, by John S. Urquhart's Son & Co., successors to John S. Urquhart. The New York "depot" is at No. 46 Courtland street.

Dixon's "Institution."

The Joseph Dixon Crucible Co., of Jersey City, N. J., is 75 years old. It can hardly be called a "mushroom institution." It has grown up and expanded with the United States of America, and today its products follow the Flag. It is a national institution.

McNab & Harlin Expansion.

The building expansion of the McNab & Harlin Mfg. Co., Nos. 56-60 John street, New York, will soon be carried into effect. The firm will enlarge its plant at Paterson, N. J., by the erection of a brick warehouse and a machine shop. They will be placed between the present shop and the foundry.

National Filter Co.

John J. McGrath, of No. 334 Columbus avenue, is the agent of the National Filter Co. "Pure water in nature's own way" is the motto of this company.

"Filtration," when successful, makes pure water.

The National filter is stamped with nature's own "O. K."

Not Magic; but Merit.

"Herrmann" was a "wizard" in his day. He excelled as a prestidigitateur. There is a Herrmann who excels as a maker of "tanks and seats of the highest grade." There is nothing magical about them. They owe their prominence to sheer merit. If you want a sample, send to No. 368 Broome street, New York.

A Good Selling Agent.

In Mr. John G. Wickes, of No. 66 Beekman street, Manhattan, the Maryland Foundry Co. (A. Weiskittel & Sons) have a selling agent who "knows his business," and is a worthy representative. A full line of the high-grade enamel iron goods manufactured at the Maryland Foundry is on exhibition and on sale in the metropolis.

Two Supply Sources.

There are two sources of supply for the Waterbury Brass Co.: (1) The New York warehouse, Nos. 122 to 130 Centre street; (2) the mills at Waterbury, Conn. "Shipment same day order is received," is one of the business-like announcements of the Waterbury Brass Co. And an announcement by the Waterbury Brass Co. is a promise.

The Pennington Foundry Folder.

The Pennington Foundry & Heater Co., of Pennington, N. J., have issued an illustrated folder, in which the undoubted merits of their wares are set forth in attractive style. The goods of this company combine two of the most desirable qualities that can appeal to buyers. They are economical, and they are ornamentally useful—or usefully ornamental.

Walworth's.

The Park Row Building is one of the famous buildings of Manhattan. It is a little city all by itself. There is more business transacted in the Park Row Building in a week than in many of the "minor cities" and "major towns" of the United States in a month. The Walworth Mfg. Co. has a handsome suite of offices in the Park Row Building.

Koven & Brother.

The works of L. O. Koven & Brother in Jersey City are noted for the general variety and particular excellence of their galvanized iron-range boilers, regular and anti-waste expansion tanks. The New York office of L. O. Koven & Brother is at 50 Cliff street. By the way, friends and readers who do not live in Manhattan ought to know that Cliff street is not built on the edge of a cliff, and that there is nothing precipitous near it.

Always Worth Attention.

The goods of the Thatcher Furnace Co., No. 240 Water street, Manhattan, are at all times well worthy of attention. Everyone who is interested in steam and hot-water heaters, radiators and specialties, should send for a copy of the pocket-size price list, giving dimensions, ratings and prices of the Thatcher sectional steam boiler, Thatcher sectional hot-water heater, Comfort steam heater, Comfort hot-water heater, Empire steam heater, Empire hot-water heater, Sterling hot-water heater, Thatcher two-column, three-column and utility radiators, Thatcher steam radiator valves, hot-water radiator valves, air valves, expansion tanks, floor and ceiling planks, etc., etc.

Master Plumbers' Outing.

The annual outing of the Manhattan Branch of the Association of Master Plumbers of the City of New York was held on Thursday, August 28. The schedule of games included a shooting contest, baseball, boating, quoits, running races, a fat men's race, and a tug of war between picked teams.

T. J. Cummins, chairman of the Outing Committee, reports that the "Manhattanese" were hopeful, healthful and happy from first to last.

The "scene of the outing" (is that a correct expression?) was Crocheron's Hotel, Bayside, L. I. The members of the committee were Thomas J. Cummins, chairman; Alexander Bryant, Thomas J. Tuomey, John Renehan, Thomas F. Gaynor, A. W. Reynolds.

A Progressive Brass Co.

The Waterbury Brass Company, whose warehouse is at No. 122-130 Center street, Manhattan, has issued a new catalogue, covering in classified form the great variety of brass, bronze, german silver, white metal and copper goods carried in their New York warehouse, where their stock is upwards of a million pounds.

In connection with the stock list the Waterbury Brass Company has introduced various tables of weights, measurements and rules which will be found of service in ordering goods, and which help to make the catalogue valuable.

The Waterbury Brass Company has taken over the right to manufacture Pope's Island white metal, which meets with great favor owing to its ductility for drawing, spinning and forming purposes. The high finish that can be obtained, and its non-corrosive qualities bring it in great demand. To the jewelry trade the "gold non-corrosive metal" of the Waterbury Brass Company is highly recommended.

"N. R." Improvements.

Nathan Rubenstein, of No. 552 Grand street, New York, the manufacturer and patentee of the "N. R." seat attachment, has gone into partnership with Schulman & Co., general contractors, who were formerly located at No. 176 Broadway. The firm is now Rubenstein & Schulman, general building and plumbing contractors. This firm has now several large contracts under way. One is the Jefferson Bank, corner of Canal and Forsyth streets.

They are building the new addition to this bank. Rubenstein & Schulman are doing the plumbing work in the Endicott Hotel, at Columbus avenue and Eighty-first street.

They are also doing the work for a large tenement house at No. 114 Suffolk street. They are doing the complete plumbing and other work of the large Turkish bath house, seven stories high, corner of Willis avenue and 134th street. They have other important jobs, and are "busy, busy, busy" all the time.

The N. R. seat attachment, which they manufacture for water-closets, and which is something new and very desirable for the trade to handle, is "presented respectfully" to the attention of jobbers who are desirous of handling special territory as agents. The advertisement of this can be seen in the monthly and weekly editions of Domestic Engineering.

Plumbing is a Profession.

Malbin & Kammerman, of 922 Third avenue, Manhattan, manufacture and carry a big stock of electric light fixtures, in addition to plumbers' supplies, roofers', tinsmiths', gas and steam fitters' supplies. A great many of the old-line plumbers are announcing that they have added electric lighting, electric bells, and electric wiring and fixtures generally to their former staples. This is not merely a measure of self defense. It is a measure of progressiveness. There is not a more progressive tradesman and mechanic in the world than is the plumber, and he does not get half enough credit for it. How many citizens remember, without being "jogged up," that, but for the plumber, our modern cities would soon become uninhabitable plague spots? The physicians and the board of health will always give credit to a good

plumber, and they recognize the fact that he is of more importance to a thickly settled modern community than is any other man or institution. The fact that plumbers are required to pass stiff examinations before they obtain their credentials makes positive and undeniable the fact that "plumbing" is not a trade at all (though it is generally and unthinkingly referred to as a "trade") but is actually and in fact a "profession." The sanitary plumber is a professional man, just as truly and accurately as is the physician, the surgeon, the lawyer. And he is of more practical, every-day benefit to the community than is either "sawbones" or the gentleman who ties up wills into knots and proves to a hypnotized jury that the sweet creature who is accused of killing his mother-in-law with a box of cyanide of potassium and a meat axe ought to be retired on a pension instead of being "electrocuted."

A Literary Leader.

To the Mott literature has been added "Catalogue No. 4, J. L. Mott Iron Works," 84-90 Beekman street, New York. The booklet consists of fifty-four pages. The general subject is Caldrons. Even to an amateur it will give a liberal education in this branch of industry; and the professionals, for whom it is intended, will be grateful for the painstaking precision and scrupulous accuracy and attention to detail exhibited in the booklet from cover to cover. Among the "specialties" noticed and described carefully and intelligently are jacketed steam kettles, cast-iron body; copper kettle with tinned or white enameled lining, capable of sustaining an 80-pound steam pressure—largest capacity 3,000 gallons. Then there is a useful portable caldron, consisting of a cast-iron furnace with cast-iron or tinned copper caldrons. The furnaces can use either coal or wood, which gives them large measure of independence from strikes and coal famines. The caldrons are made in from 10 to 200 gallons' capacity. The catalogue also lists white enameled caldrons which can be supplied for these furnaces. Lead-melting, brass-melting crucible, and other forms of furnaces are shown in different styles, in capacities varying from 10 to 20 gallons.

Attention is directed to a line of portable wrought-iron furnaces, mounted on wheels, for use in melting lead for calking the joints of cast-iron pipes used for gas and water-mains.

Another variety of furnace displayed is a portable wrought-iron article, mounted on wheels. This is used in melting lead for calking the joints of cast-iron pipes used for gas and water-mains. Other "features" are round and square caldrons and tanks coated with white enamel; wrought-iron wagons for hauling varnish kettles; steam tanks and covering plates; heavy fire-doors and frames, solid dampers and grate bars, cast-iron flue linings for equipping furnaces for any kind of work; large copper caldrons, copper-jacketed steam kettles, varnish kettles and kettles for special work. A furnace and pot for melting type metal, made by "Mott's," in three sizes, with capacities for 250, 500 and 1,000 pounds respectively, is used with gas for the fuel. Caldron making and mending is a right venerable and honorable industry. "Fire, burn and caldron bubble!" chant the weird sistsers in Shakespeare's "Macbeth;" and an ancient Scottish "industry-song" asks:

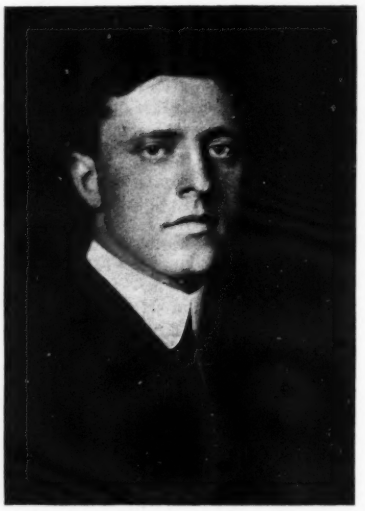
"Ha'e ye ony pots and pans,
Or ony broken chaudrons?"

"Chaudron" is the Lowland Scotch variant of "caldron." It is likely that there were caldrons before the Flood; but the antediluvian article was hardly comparable with the artistic and highly efficient article turned out by the J. L. Mott Iron Works.

Eastern Trade Golf Tournament.

New York City, Sept. 11.—(Special.)—The first annual tournament of the Eastern Trade Golf Association came off today at the Fox Hills Golf Club's links, on Staten Island, and was a thoroughly creditable and enjoyable event. Good golf was played, and the players and gallery were enthusiastic over the success of the tournament. Members of the Eastern association look forward now to a team match between representatives of the Eastern and Western associations to demonstrate the superiority of the golf played in the two fields of activity

The illness of Secretary H. A. Smith, of the Eastern Trade Golf Association, was inopportune and unfortunate. Poor Mr. Smith would almost have "gi'en his lugs" if the fall tournament, could have been more opportunely set for him. But pleasures are very uncertain, as the man said when he choked on ice cream.



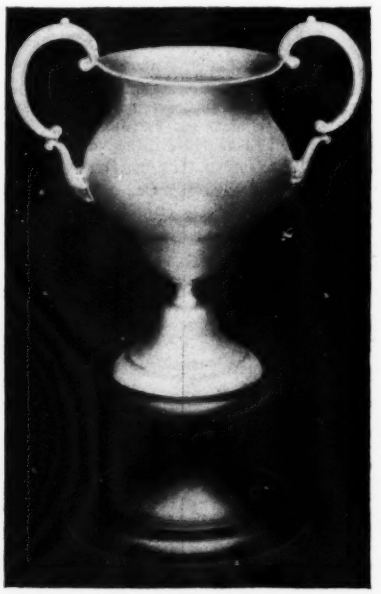
Frank H. Simmons.
Winner of Engineering Review Cup.

The game (or the Gem—pronounced with a hard "g") was played, over the links of the Fox Hill Golf Club, on Staten Island. The use of the grounds was given free of greens fees. The players met, according to invitation and to program, at the Staten Island ferry at 9 a. m. Captain Molby and the committee met the visiting Knights of the Royal Game and gave them welcome and entrance to the grounds. A few stragglers, not on hand at the time appointed, took the Staten Island rapid transit road to Clifton, where they "embarked" on omnibuses.

What with players, guests and spectators there was a big crowd; and it was a jovial crowd and a happy crowd. Golf is, of all out of door games, the most sociable and that which most invites to and encourages sociability.

The program was arranged with studious care in every detail. In order to determine the classes into which players should be divided, an eighteen-hole qualifying game was played in the morning. In the afternoon the game was "regular" and severe. The players were classed in groups of four, and played eighteen holes, medal play. This arrangement was highly satisfactory and as fair as fair could be. Every player had a chance for a prize. Among the enthusiasts who were first to enter were Messrs. Glove, Martin, Pearson, F. W. Smith, Ainsworth, Aird, Molby, Herendeen, Haywood, F. H. Simmons, Hovey, Barrett, Keesby, Carter, Paul Marsh, Kellogg, Hill and Thayer.

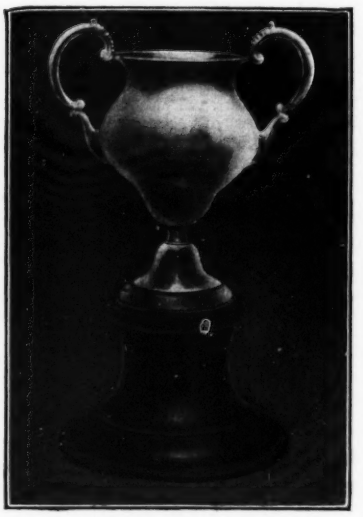
The afternoon contests were won by the following gentlemen:



Domestic Engineering's Cup.

President's cup, presented by Charles H. Simmons for the best medal score for 36 holes, won by W. H. Thayer, of Smith & Thayer Co. of Boston.

Engineering Review cup, given by the *Engineering Review* of New York for first flight, won by Frank H. Simmons, of John Simmons Co., New York. W. H. Thayer, of Boston, runner up. Mr. Simmons had to play off a tie with F. B. Barrett.



The Metal Worker's Cup.

Domestic Engineering Cup, given by this journal for second flight, won by F. B. Barrett, of Pierce, Butler & Pierce Mfg. Co.'s New York office.

Plumbers' Trade Journal cup, presented by the *Plumbers' Trade Journal* of New

York City for the third flight, won by Henry S. Martin, of the United States Radiator Co., of Dunkirk, N. Y. H. Hovey, runner up.

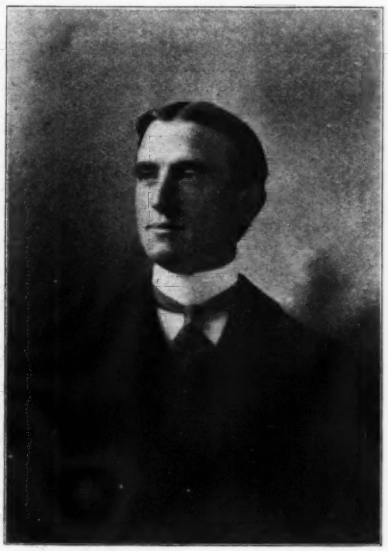
The Metal Worker Cup, presented by The Metal Worker, of New York. Won by Howard W. Walton. P. M. Seward, runner up.

The Pierce, Butler & Pierce Cup, presented by the Pierce, Butler & Pierce Mfg. Co., of Syracuse, N. Y. Won by Frank C. McLain, of New York. A. W. Main, Jr., runner up.

Club Challenge Cup, presented by the Eastern Trade Golf Association. Won by P. R. Jennings, of Bruce & Cook. W. H. Thayer, of Boston, runner up.

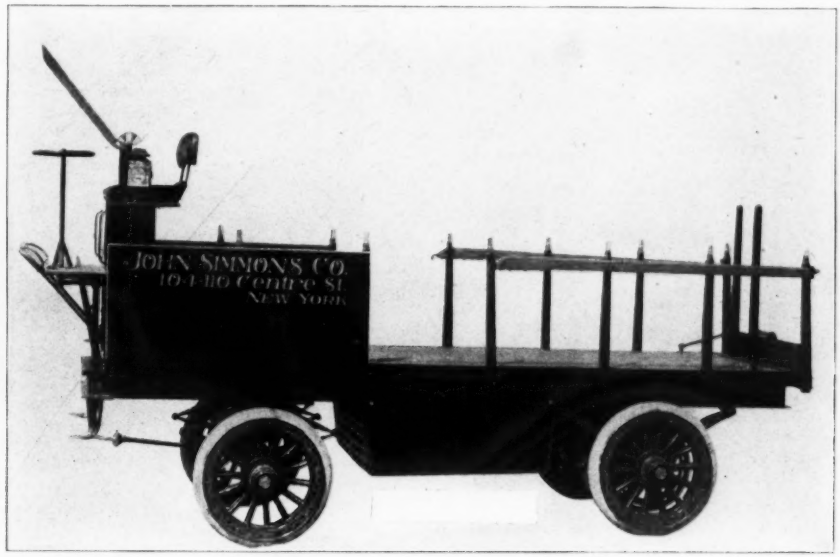
Bruce & Cook Cup, presented by Bruce & Cook, of New York, for longest drive. Won by Capt. E. C. Molby, captain of the association, of Pierce, Butler & Pierce Mfg. Co.'s New York office, whose average drive was 244 yards.

When the returns were "all in" it was found that Charles K. Foster had scored 88 in the qualifying round, and had won the handsome bronze golf-player "presented by W. A. Russell & Co., of Detroit and New York for best score for first eighteen holes, open to eastern and western contestants, to be won three times consecutively to become property of the winner." Mr. Foster, as a western man, got a "feather for his cap," and begs leave to send it home with his compliments. He says that the east will have to hustle if it ever expects to see the Bronze Golfer again, as the west will win "straight three" or know the reason why.



Frank B. Barrett, of Pierce, Butler & Pierce Mfg. Co., New York City, Winner of DOMESTIC ENGINEERING's Golf Cup.

Pierce, Butler & Pierce Golf Cup. Won by Frank C. McLain, of New York City.



John Simmons Co.'s Auto Truck.

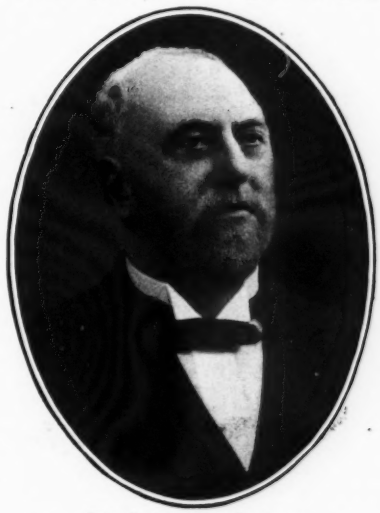
SCORE: FIRST FLIGHT.

	Out.	In.	Total.
P. R. Jennings	45	44	89
W. H. Thayer	50	39	89
F. B. Barrett	46	48	94
Frank H. Simmons	48	48	96
SECOND FLIGHT.			
Frank C. McLain	53	48	101
A. W. Maine, Jr.	55	51	106
E. C. Molby	54	54	108
W. L. Herendeen	54	56	110
THIRD FLIGHT.			
H. S. Martin	49	50	99
H. Hovey	53	52	105
W. C. Marsh	58	56	114
E. F. Glore	66	57	123
FOURTH FLIGHT.			
H. W. Walton	52	54	106
P. M. Seward	68	57	125
H. D. Carter	60	66	126
A. A. Ainsworth	64	68	132

JOHN SIMMONS CO. AUTO-TRUCK.

The auto-truck of the John Simmons Co., 106-110 Center street, New York, is a marvel of beauty, utility and power, and as it is a pioneer in its way it is well worthy of especial mention and illustration. The delivery wagons, both for the speedy newspaper and the widely scattered dry goods service, have already been "autoed," but it was left to the John Simmons Co. to set both the pattern and the pace in a big and solid, and withal light and speedy vehicle, evolved out of the old-fashioned, cumbrous, lumbering, thunderous, "lorry" idea apotheosized (only word possible) by means of padrimmed, noiseless wheels and modern science into an automobile wagon, as light on its heels (which is to say, its wheels) as a "run-about;" and as powerful as any "mammoth furniture van" that ever broke down in the middle of Broadway while attempting to transport a house and lot at one "flitting," and kept that noble thoroughfare choked and glutted with teams and teamsters, and thick with brimstone-and-treacle language, until the Harlem cows were coming home. The auto-truck has none of the bad habits of the lorry, and the auto truckman has none of the bad habits of the lorry man. You can break the auto-truck up—with an ax—but you cannot break it down with a load. It is believed that the auto-truckman can still be broken down with a load; but as it is now only a question of time until he is replaced by a mechanically intelligent Ajeeb, with wheels in his brains and electricity in his viscera, he can be regarded with at least as much sympathy as that which the poet, long ago, bestowed prophetically on the passing horse:

"Good-bye, old Hoss. Now we must part;
You useter draw the bloomin' cart.
You useter haul up all the passengers,
But now you'll make Bo-logna sassengers."

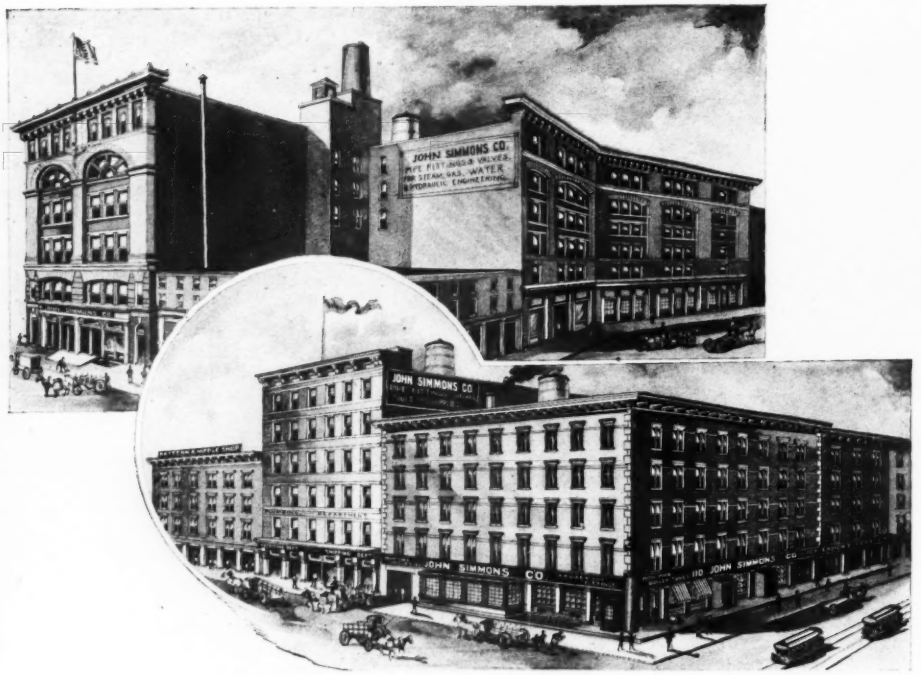


THE LATE JOHN SIMMONS.

Talking to a representative of DOMESTIC ENGINEERING, President Charles H. Simmons, of the John Simmons Company, said: "Ever since the probability of using some motive power other than horse for the transfer of material, both for delivery and shipping, has been under consideration, we have been interested in the subject, and have watched with much interest the various 'auto' productions which have been 'evolved' from time to time. We have investigated

every wagon that we thought would be of service to us. There is no doubt as to the practicability of the auto-truck with storage battery for its motive-power supply. A change from horse to automatic power seems to be absolutely demanded in New York by force of circumstances—by which, I mean, geographical and topographical circumstances. When the now-deposed horse was king, it was with us a matter of frequent and unavoidable occurrence that a double truck would leave our place in the early morning and not return until late at night. This, besides being expensive, was very annoying in many ways. For instance, although our horses received the very best of care, we had had so many 'experiences' that we were never surprised to hear that a horse or a team had unexpectedly given out before reaching its destination. Every man who has employed horses for long hauls and more or less heavy trucking will tell you the same thing. A horse resembles a human being in the fact that, no matter how desirable it may be in theory, he cannot, in practice, be in training all the time. Therefore, you see, there is always, under the most ideal circumstances, an element of uncertainty in a service that is dependent upon horses. With the adoption of mechanical power, certainty becomes more of an assured factor in the business equation; and another element of loss, or of "waste" if you will, is eliminated.

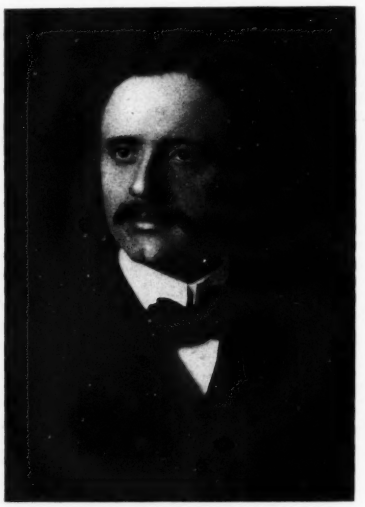
"Our auto-truck was built especially for the needs peculiar to our business. It can carry iron pipes, and any other specialty of ours that has been sometimes difficult to adjust to old-fashioned trucks or lorries. The auto-truck will travel twenty-five miles on one charge of electricity, and carries four tons at a speed of about six miles per hour."



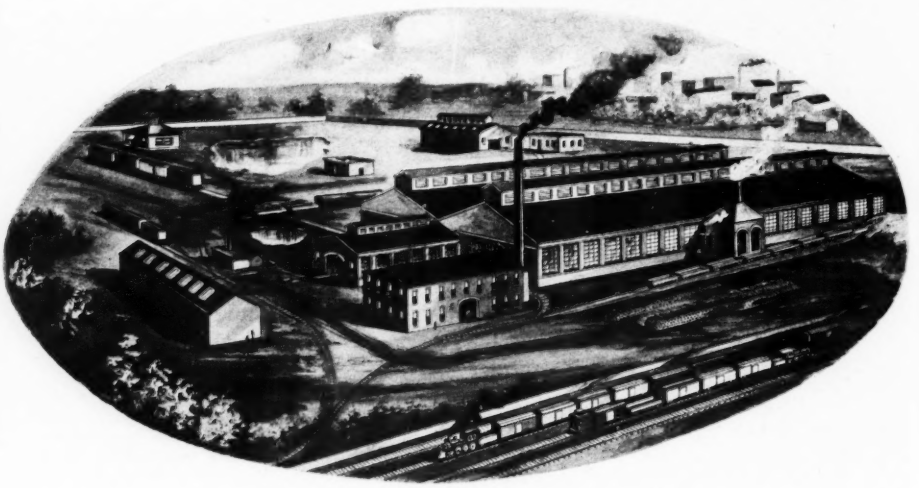
John Simmons Co.'s Buildings, 106-110 Centre Street, New York City.

CHARLES H. SIMMONS.

The John Simmons Coompany is one of the best known in the United States in its own lines. They job wrought iron pipe, boiler tubes, cast and malleable iron fittings, brass and iron valves, etc., supplies for plumbing, steam, gas, water and oil. Charles H. Simmons is the president and treasurer, John S. Simmons is the vice president, and Frank H. Simmons is the assistant treasurer. For many years the firm has conducted, on a large scale, the sale of everything that pertains to steamfitters, engineers' supplies, tools, etc. Their premises, at Nos. 106 to 110 Center street, Manhattan, near the office of DOMESTIC ENGINEERING, have been occupied by them for over fifteen years. Of course in that time the office fittings have kept pace with the general progress of the firm, and the premises have been frequently overhauled, renovated, and brought up to date. They have what may well be called a model store and warehouse. The offices of the executive department are tastefully arranged, and are provided with every known convenience to expedite the handling of their large business in all its details. They are the New York agents of the Jarecki Manufacturing Co., Limited.



John S. Simmons.



John Simmons Company Foundry and Coil Shops.

Boston & New England

Office: 32 Oliver Street **Tel. Main 3036**

ELMER CRAWFORD, General Manager. **E. C. Stokes, Representative**

Magee Manual.

The second edition of the Magee Manual has just been issued, and while it exploits the merits of Magee Heaters for steam and water it is so complete a manual of information that it should find its way into the hands of every steam fitter in New England. It is a little book of 84 pages, size 3¾x6¼ inches, handsomely bound in water grain black leather embossed in gold. In the front pages of the book is given a full description of Magee sectional and round fire pot steam and hot water heaters, tanks, fittings, etc. Following is data relative to direct and indirect radiation for both steam and water, green house and conservatory heating. A discourse on heating and ventilation and fuel and combustion, construction of buildings, chimneys, etc., followed by suggestions to the fitter of very practical value and complete in detail and showing numerous illustrations of the different systems of piping. Then follows an abstract of Massachusetts laws, a table of temperatures in various localities and several pages of useful information, such as the various conditions of water, heat units, horse power, weights of fuels, expansions of pipe, boiling points of fluids, weights and measures, Standard lists of pipe and fittings, iron and brass Standard sizes of horizontal tubular boilers, areas and circumferences of circles and some pages for memoranda, making as a whole a most convenient and handsome book to have around and one that will undoubtedly be eagerly sought after by the trade. Mr. Higgins says: "We have of course only a limited number of these manuals but we will be glad to send them to those fitters who mention Domestic Engineering.

Deep Sea Fishing Trip.

On Thursday, the 11th inst., a party of some twenty gentlemen, members of the New England Supply Association, and their friends met aboard the good sea going tug William H. Gallison and at 10:15 a. m. headed down the harbor for an all day's sport with deep sea lines off the mouth of Boston Bay. Secretary Dupee, with his yachting cap and brown sweater, was on hand early to meet the party. Louis Bourneuf and C. E. Lennehan came up from Lynn. P. J. Lynch, of the Thomas Hoey Manufacturing and Supply Co., broke into his vacation in order to be on hand and incidentally to get a few snap shots.

The Indian, P. J. O'Brien, of the James Barrett Manufacturing Co., was a little late but still in time to get aboard. T. W. Roulston, in charge of the steam fitting departmen of the W. H. Gallison Co., in a blue sweater, soft hat and briar wood pipe, looked dangerous from the beginning and proved a winner. Jesse Y. Baker, of the same company, looking the man of many bites and few fish, as spick and span as usual. Jim Green, of the F. W. Webb Manufacturing Co., who ran away with the fish prize on the previous fishing trip, looking just as solid and clerical as ever. "Eddie Butler," of E. F. Butler & Co., the athlete of the party, in a white sweater. Mr. Frank Locke, of the Locke & Stevens Co., who fought hard all day with the gyrations of Father Neptune and only gave up in short intervals. Mr. S. J. Little, the Eastern representative of the Louis Lipp Co., of Cincinnati, made up the national colors by appearing in a red sweater. Mr. M. A. O'Brien, of Troy Bros. Co., who dropped off at Pemberton on the return trip in order to reach Nantasket Beach and his summer home. George A. Polsey, of the Sumner & Goodwin Co., who caught more curiosities and monstrosities than all the rest put together. John T. Moore, secretary and treasurer of The Sanitary Earthenware Specialty Co., of Trenton, N. J., who never caught a fish in his life, to hear him tell it, but who managed to land a fish on deck before the first whistle stopped blowing; and it didn't blow very long at that. E. C. Stokes, of Domestic Engineering, in a "little Willie" blue cap, who found later that he had left his luck at home, only caught two fish, but got a prize by a fluke. John E. Frenning, of the S. M. Howes Company, who proved the quiet man of the party. George Hickmott, of the Boston Brass Company, makers of the famous B. B. ball cocks, with a rain coat that drew attention from every boat passed, received a salute from many. Mr. Small, a guest of Mr. Dupee's, and a never-to-be-forgotten friend of all before the day was over, and William Wiley, of the George Woodman Company, the big man.

A swift run down the harbor was made, and the famous seven-masted steel schooner Thomas W. Lawson, of Boston, the only one of her class afloat and the largest sailing vessel in the world, was sighted off "The Graves." Upon request for a near sight of this new wonder of the world, the Gallison ran up under her stern and then passed to windward, affording a most beautiful view. She gave a parting salute from her steam siren. In many ways the Lawson is unique; her masts are of steel; her sails are worked by steam power, the same engine furnishing power for her stearing gear and the same boilers furnishing heat to her different apartments through Exeter radiators of the W. H. Page Boiler Company, thus making her the only steam heated schooner afloat. After this little side trip the tug was headed for the fishing grounds off the lightship and soon every line was baited and over, and sport began. The first caught proved to be a silver hake, a gamy little fish, but not what the party wanted or expected, and it was a relief to get into deeper water, where bites were scarcer but fish larger. Dinner in the cook's galley was announced at 1 o'clock, and gradually the hungry party was fed on roast beef, roast lamb, vegetables, puddings, pies, coffee and fruit. The drift of the tide having carried the tug well in shore, after dinner a second start was made for new grounds. The sturdy fishermen kept well at it until the whistle sounded the retreat at 4:30. Clam bait gave out about 3 o'clock, and only by purchasing on the high seas could the fishing go on. However, little fish were sacrificed to appease the hunger of their larger brothers, and the game went merrily on until the designated time. The party then adjourned to the captain's cabin, where records had been kept, and the following prizes were awarded amid the hearty cheers of all assembled:

First Prize: Largest number of fish caught—A portable shower, given by Standard Sanitary Manufacturing Company, to P. J. O'Brien, with a record of 14.

Second Prize: Largest fish caught—A jardiniere, given by Trenton Potteries Company, to J. W. Roulston, of the W. H. Gallison Company, for a rock cod of 8½ pounds.

Third Prize: Second largest fish caught—Welsbach drop lamp, donated by E. C. Stokes for Domestic Engineering, to P. J. Lynch for a cod of 5 pounds. The Indian O'Brien had one of his string weighing nearly 6 pounds, and also hauled in the second fish, but rules barred him from but one prize.

A group of sea birds at the Shore dinner.—At Bass Point.

Fourth Prize: Smallest fish caught—Ash holder, donated by H. F. Livermore, to J. Y. Baker.

Fifth Prize: First fish caught—Solid brass match safe and ash tray combined, donated by the Hamlin & Emery Brass Company, makers of brass fittings, to John T. Moore.

Sixth Prize: Second fish caught—Bronze candlestick, donated by W. A. McKenney, of McKenney & Waterbury, gas and electric fixtures, to E. C. Stokes, of Domestic Engineering, who caught the third fish.

Seventh Prize: Last fish caught—Fifty cigars, donated by C. A. Burns, of Union Soapstone Company, to Louis Bourneuf.

Eighth Prize: Largest sculpin caught—A 6-inch Stillson wrench, donated by G. A. Coppins, of the Walworth Manufacturing

Company, to James Green, who had a fine string of cod and haddock, but not enough to land another prize.

Ninth Prize: No fish caught—A letter opener, donated by H. F. Livermore, to Frank H. Locke.

Tenth Prize: Same as ninth—To E. F. Butler.

After prizes were awarded Mr. Lynch grouped the party on the upper deck and secured his biggest snap of the day. He then gave a short address on the beauties of Boston harbor and the plumbing trade.

Seven o'clock saw the Gallison once more tied up at her wharf and with many expressions of good feeling and delight at the day spent the party broke up, vowing vengeance on the fish some day next summer.

The Youngest Master Plumber.

Mr. W. L. Green, at the age of 22 years, is the proprietor of an old-established plumbing shop at No. 144 Harrison avenue, Boston, which he runs under the firm name of Jno. Cooper's Sons. Mr. Green, at the early age of 14 years, took up the actual beginning of the plumbing trade under the tutorage of his grandfather, Jno. Cooper, one of the oldest and most respected members of the plumbing trade in Boston, who passed away during last winter, while still actively engaged in business. Mr. Cooper was a student, not only in his profession but also of human nature, and was, from his large theoretical, as well as practical knowledge, eminently fitted as a preceptor. Mr. Green not only took up, carefully, the study and practice of plumbing in this way, but added to his knowledge by later taking

W. L. Green.

up wood turning, pattern making and moulding. After his grandfather's and uncle's death he assumed charge of the business on March 27th last, at an age of under 22, he having been born on August 1, 1880. His lack of years, however, are compensated for by his thorough knowledge of the intricacies of the business. The Hub leads in many things in the plumbing line, and it is but natural that some precocious youngster of her fold should lead in the matter of age .

At Lake Quinsigamond.

The sun never shown on a more perfect New England morning than that which welcomed his arrival on Friday, the 12th inst., the day chosen for the regular quarterly meeting of the Massachusetts State Master Plumbers' Association, which combined an outing at Lake Quinsigamond. There was just a tinge of early fall in the air that lent it deliciously invigorating

David Craig as Umpire.

qualities,. just a suspicion of a haze that softened the landscape and seemed to bathe again the face of nature until—but why try to describe a perfect New England morning? Abler pens have failed, and one must needs be of one to appreciate it. At 9 o'clock, then, on the morning of a perfect day, there was a gathering of the clans at South Station, Boston, to take the train for Worcester. A special car had been attached to the regular Boston & Albany express, and when the train started it bore along a merry party of about sixty, including delegates and ladies. President Daniel Shannon and David Craig, the national committeeman, with his cane, were there. Secretary G. O. Johnson and J. T. Drury were, of course, to be found among the early arrivals, while among the crowd could be seen the smiling countenances, of C. T. Dame, of Lynn; Mr. Curtin, of Page & Curtin, of Medford; T. F. Garvey, of Everett; E. W. Cox, of Pierce & Cox, Boston; G. W. Branch, and a list of others too long to mention, all bent on a good time and on a quick disposition of the business on hand. On arrival at Worcester members of the party were quickly supplied with tickets by members of the local committee of that city, entitling the holders to rides to and from Edgemere on the shores of Lake Quinsigamond and a shore dinner. A short delay was occasioned by the non-arrival of a special trolley car and a wait of eight minutes for arrival of train from Springfield. The large trolley car was comfortably filled when it started to the lake; nearly one hundred persons went down on this trip. As the car passed through Worcester the many points of interest were pointed out by former State Vice President James C. Luby, who managed to make himself fairly well heard even above the noise of conversation, good natured chaff and the usual trolley rumble. Immediately upon arrival of the party at Edgemere the base ball game between the married men and the single men was started. David Craig was selected umpire, and distributed errors and decisions that would have caused his death on any other field, with an impartial hand. The single men's nine was composed of F. B. Jordan, shortstop; C. T. Dame, left field; Peter Maitland, second base; John J. McGraw, pitcher; E. G. Clair, first base; C. W. Ostberg, third base; D. Costello, center field; W. B. Holmes, catcher; T. F. Carey, right field. The married men's nine was composed of J. P. Drury, pitcher; T. F. Garvey, shortstop; T. F. Connelly, first base; W. J. Highland, left field; C. C. Brown, second base; H. Sullivan, third base; F. O. Johnson, catcher; E. W. Cox, center field; John Bassanett, right field.

Only three innings were played before dinner was announced and resulted:

Single men	2	0	1—3
Married men	0	2	0—2

The single men first went to bat and Jordan swiped the first ball pitched for a home run, the only one made during the game. But there were catches and runs that were wonders. E. W. Cox made a three-base hit and started the rooters for his side.

Dinner was served in the open air on a sort of piazza, evidently built for the purpose for which it was used, and was found to be most excellent, consisting of the following menu. About 120 persons enjoyed the repast:

Chowder

Sliced Tomatoes Pickles

Baked Clams

Boiled Codfish

Clam Fritters Green Corn

Boiled Fresh Lobsters

Watermelon

Coffee Cakes

Cigars

After dinner the committee on sports, consisting of F. B. Jordan, A. A. Redyard, John J. McGrath, J. P. J. Cahill and C. C. Brown, arranged to have the events for ladies fulfilled while the actual meeting of the association was in progress on the dance floor. The first event was a potato race, in which there were six contestants, each with a

Frederick B. Jordan, Worcester, Mass.

string of twelve potatoes to put in the pan. The contestants were Mrs. Charles Albee, Miss F. W. Desper, Mrs. William Holmes, Miss Gertrude Holmes, Mrs. M. D. Holmes and Mrs. C. C. Brown. Miss Gertrude Holmes won in 2½ minutes. Mrs. M. D. Holmes was second. First prize, one pound box of Huyler's candy; second prize, half pound box of same. Next came the egg race. Six contestants—Miss Holmes, Mrs. William Holmes, Mrs. Charles Albee, Mrs. T. F. Garvey, Mrs. J. O. Johnson and Mrs.

William McKenna. Won by Mrs. Albee, with Mrs. Garvey a close second, leading Mrs. McKenna by a hair. The prizes same as above. Then came throwing the base ball, in which the unlucky number of thirteen took part, and the trees both back and front were scarred and scratched, and everything within a ten-acre lot was hit in some way. Mrs. Charles Albee proved the best thrower of the ladies, with Mrs. Garvey only about one foot short. This event was finished just as the quarterly meeting

A Bunch of Lake Loveliness.—At Quinsigamond Outing.

broke up, and an invitation was extended to the entire party to take a trolley ride through and around the city of Worcester as guests of the Callahan Supply Company. About 4:30 the party started and in two hours and a half visited many interesting places and saw some of Worcester's beautiful surroundings. As one plumber remarked, "If Rome was built on seven hills, as we have all been taught, then Worcester has got that old town skun to death. She must have seventeen, at least."

PENCILINGS.

Didn't Luby remind you of "Seeing Boston"? Was it his fault that the car ran off the track or did Dave Craig drop his cane on the track?

What about that mile around building and who was it that asked if it was a Plumbers' Home?

John Manning, of school house fame, was on hand—just in time for dinner. Mr. and Mrs. W. H. McKenna came a little late, but didn't get left.

Did you see the table served for two?

Wonder if they will ever run that trolley road to Edgemore?

The committee was disappointed that a larger number did not attend, but those who stayed away are the disappointed ones now.

Badges were neatly gotten up and served to keep the party together.

The Callahan Supply Company surely never had more plumbers under their roof at one time than when the short stop was made in front of their store.

Just a few supply men were visible at the outing. T. E. Carey, of Peck Bros. & Company; T. N. Callahan, of Callahan Supply Company, and one of their popular salesmen; H. Carload De Wolfe, of Sweet & Doyle. E. F. Butler was reported on the train, but was not seen afterwards.

The new president of the Worcester Master Plumbers' Association was in evidence all the time and made many friends. Mr. Frederick B. Jordan is one of the youngest presidents in the state. He is only 26 years of age, yet is president also of the J. W. Jordan Company, of 609-611 Main street, dealers in stoves and ranges, as well as plumbers, and carying on one of the largest businesses of its kind outside of Boston. He is a military man, a Cuban war veteran and at present second lieutenant of Company H., Second regiment of infantry, M. V. M. Mr. Jordan assumed active charge of his father's business about two years ago, and upon the death of that gentleman last year took up the entire responsibility. His company has recently been incorporated under the laws of Massachusetts and they are pushing strongly ahead.

Massachussets

BUSY.

N. Perry & Co., of Attleboro, Mass., are doing lots of busiess in both the heating and plumbing lines this summer. Among the other things they now have on hand they are installing a No. 30 All Right boiler made by the William H. Page Boiler Co., in the new church in their city.

WORCESTER NOTES.

The building trades of Worcester have not been very busy this summer, and in consequence the general plumbing trade has not a large amount of work ahead. There is a considerable amount of repair work but a dearth of new buildings.

The J. W. Jordan Company, of 609-611 Main street, are just completing the remodeling of the plumbing in the Y. M. C. A. building, and have installed nine rain baths, four combination needle and shower baths, one new tub, three Aquameter closets and three syphon urinals, besides a number of lavatories. Everything is fitted in the most approved styles and the baths separated with Italian marble and furnished with granolithic floors. There is an 18,000-gallon swimming pool in the building and a new supply will be added to this.

J. T. Cahill & Son, of 18 Pleasant street, are finishing the plumbing of the Second regiment armory, in which they have placed twelve of the J. L. Mott Iron Works' combination needle and shower baths, a 1,000-gallon boiler for pressure and a Mott's Sun Ray heater. They have also just completed the plumbing in the new $20,000 club house of the Tatnuck Country Club, at Tatnuck, Mass., in which they used three combination shower baths, seven lavoratories, six syphon jet closets, two enameled tubs, two pantry sinks, one kitchen sink, a 200-gallon boiler and a 1,000-gallon tank for supply.

COMING TO THE FRONT.

The Jefferson Mfg. Co., makers of the Jefferson unions and flanges, are very rapidly coming to the front. Their new factory in Lexington, Mass., is now running at its full capacity and, in order to keep pace with their sales, they are turning out thousands of their unions and flanges per day. The factory itself is situated in an ideal spot, on a hillside, in the historic old town of Lexington, and, while it seems a little incongruous in that sleepy old hamlet, is a veritable hive of industry. Every wheel is turning, every man at work, and a constant stream of their products is finding its way into barrels and boxes for shipment to some of their many customers. Each department of the manufacture is fitted with the latest improved machinery, and every contrivance and convenience for the comfort of the hands and the insuring of the right kind of unions is to be found. The oil for the lathes and cutters is drawn from a tank in the attic and, after use, finds its way back to a reservoir in the basement, from which it is again pumped into the tank. The lathes are filled with automatic chucks and drills, adjusted to a nicety, so that every male or female part is just like any other part of the same character. But in order to make every joint absolute, each Jefferson union or flange is made up of male and female parts that have been ground together with flour of emery until perfect contact throughout is assured and the remotest possibility of a flaw is removed. General Manager L. L. Reilley of the company says: "The Jefferson unions and flanges are meeting with new successes and making new friends every day. Our troubles are increasing to keep up with the wants of our long list of customers. The simplicity of the Jefferson products, together with their excellent points and the satisfaction in their use, has made an extraordinary demand for them. You will hardly believe me when I tell you that we have now on our books as steady customers such firms as The American Locomotive Works, of Schnectady, N. Y., Manchester, N. H., and Providence, R. I.; the Hunter & Dickson Co., and C. J. Rainear & Co., of Philadelphia; The Central Supply Co., of Minneapolis, Minn.; Allen & Reed, Inc., of Providence; Brahman, Dow & Co., The Thos. Hoey Mfg. & Supply Co., and The Sumner & Goodwin Co., of Boston; J. T. Freeman & Co., Woburn, Mass., tannery supplies; Haubman & Loeb, Inc., of New Orleans, La.; New England Gas & Coke Co., Everett, Mass.; The Pittsburg Supply Co. and the Pennsylvania R. R. Co., of Pittsburg, Pa., and hundreds of other equally reputable concerns that are hurrying us every day. The shape and looks of our products as they leave the factory are some of the telling points, but the best talking point we have is the satisfaction found in their use. They can't help but be right under any circumstances."

Mr. E. M. Hall, a well-known business man of Everett, has just been elected treasurer of the company, and has taken up his position at the factory, thus relieving Mr. Reilley of some of the details of business. They have also just issued a new price list and discount sheet, that they will be glad to send you upon application and mention of DOMESTIC ENGINEERING.

Philadelphia

Telephone 21-41 Office: 18-24 S. Seventh Street

ELMER CRAWFORD, General Manager. M. H. Hawkins, } Representative

WELL-KNOWN FIRM UNDER NEW NAME.

The National Radiator Company are the successors of the Fowler Radiator Manufacturing Company, which change took place on or about the first of the present year, with Samuel B. Waters president, John H. Waters secretary and treasurer. The parent firm is located at Johnstown, Pa. The Philadelphia branch being one of many. With Mr. Pierce as manager he has not only the trade of Philadelphia to look after but that of eastern Pennsylvania, New Jersey and a portion of Delaware. They have placed on exhibition at their office in the Builders' Exchange three new Century radiator shields, together with a full line of radiators. This firm has just received a large order for radiators from Johnson & Morris, of Washington, D. C. The new Century shield is neat and ornamental, easily attached or detached from the radiator and prevents the walls and decorations from being soiled by checking the upward current of dust in the air. Those wishing anything in their line will do well by giving the National Radiator Co. a call and will find in Mr. Pierce a genial gentleman.

PHILADELPHIA MASTER PLUMBERS' OUTING.

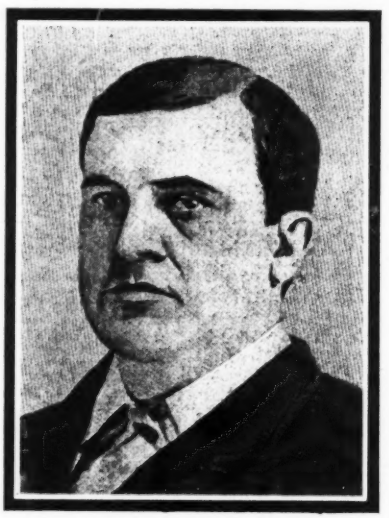
The annual outing of the Master Plumbers' association of Philadelphia took place at the "Orchard," at Essington, Delaware county, Pa. The Orchard belongs to a political club and is a beautiful place some twenty miles below the city, situated upon the Delaware river. The use of the place was secured by William McCoach, who, being prominent in association affairs, is also politically. A special invitation had been tendered to the Reading association of Master Plumbers as the guests of the association, the expense of each member together with one lady to be borne by the association. Louis J. Sommers, national vice president, and Howard Smith, state secretary, met Ira Budd, Zimmerman and Zeitler, state officers of New Jersey, at Broad street station, when they repaired to the Rathkeller for refreshments. After taking a pleasant drive given to their guests they joined the assembly at the Baltimore & Ohio depot, 24th and Chestnut streets, where they took the 12:35 train, arriving at Essington at 1 o'clock. They indulged in games, the most prominent being the baseball game between the Master Plumbers' association and the commercial travelers of the different jobbing houses, the score being 11 to 7 in favor of the Master Plumbers.

The feature of the game was the playing of Howard Smith, Harry Righter and Dennis Kennedy of the Master Plumbers, and Grant of the John Douglas Co. and Walther of the H. B. Smith Co. It would be quite the thing for the Philadelphia jobbers to inaugurate a ball team to play M. P. A.'s A football game was also a feature of the day, in which Wm. Clark, secretary of the Philadelphia association; Louis J. Sommers, Gregor Drummond, Barry, Zeitler, Budd, Zimmerman and others took part. It was a surprise to see the activity of Mr. Sommers, who outplayed the younger members. William Clark lets nothing pass him, being unable to stop the ball with his hand bunted it with his face and being so elated with his prowess turned a double back summersault. As kickers they demonstrated their proficiency. They then took themselves to the club house, where an excellent course dinner was served by the caterer. A naphtha launch was at the disposal of all and a very enjoyable ride on the Delaware was highly enjoyed by many. They were invited to partake of the various fruits which are cultivated there, such as grapes and all the fruits of the season. They left Essington at 7:26, arriving at B. & O. station about 8 o'clock, when they dispersed for their various places of abode. The committee being D. V. Kennedy, chairman; Geo. F. Uber, Wm. McCoach, Louis J. Sommer, S. W. Batty, J. F. Dempsey and Wm. S. Clark. About two hundred persons, one hundred and twenty-five members and seventy-five of their ladies, were present.

Washington, D. C.

ALEXANDER R. SHEPHERD DEAD.

Alexander R. Shepherd, who was vice president of the board of public works of the District of Columbia during the territorial government of the district in 1871, and two years later was governor of the



The Late Alexander R. Shepherd.

district, died September 12 in Batopilas, Mexico. He was 67 years of age. The cause of death was peritonitis brought on by an attack of appendicitis.

Mrs. Shepherd, accompanied by her son-in-law and daughter, Dr. and Mrs. Frank Merchant, who reside in Washington, were informed of the serious illness of the governor the day before and left at once for Batopilas.

Gov. Shepherd, as the executive officer of the board of public works in spite of vigorous opposition, began and successfully continued improvements in all parts of the city, with the result that Washington became a magnificent capital. To the governor is given credit for nipping in the bud a project for the removal of the capital to some western city, which was warmly agitated at one time. He leaves a widow and seven children.

Alexander R. Shepherd was born in Washington on January 31, 1835. His parents were of Maryland stock. He was a plumber by trade, and a broad-minded, far-sighted, public-spirited citizen, and President Grant used to say that he would have been the greatest military chieftain America ever knew if he had gone into the army during the Civil war.

As a young man he devoted much of his time to politics and by 1870 was recognized as a political power. Washington was a city of swamps and mud banks.

President Grant appointed Shepherd governor of the District of Columbia. From that time Washington had improvements of all kinds. The streets were torn up, unsightly buildings were removed, wide avenues were run through old estates, splendid public buildings were erected, a complete system of sewerage was introduced, and the avenues were paved.

When Shepherd was at the head of the government of the District of Columbia he started that comprehensive plan of improvements which has made Washington, in the opinion of Englishmen, Frenchmen, Germans, and others familiar with the most splendid of Europe's capitals, the most delightful residence city in the world. He was reviled in his day, however, was stigmatized as a "rascal" and was virtually driven out of the city. Never did a man gain a more complete vindication. His plans were in such shape when he was hunted from Washington that the men who assumed the government after him were obliged to carry them out, and the consequence has been that a new, greater, and immeasurably more magnificent Washington has taken the place of the city which the country knew before his day.

Shepherd could say of Washington with as great truth as Augustus said of Rome: "I found it a city of clay and brick, and I left it a city of marble."

During Shepherd's administration the citizens of Washington were denouncing the "boss" and accusing him of corruption, but he turned a deaf ear to every one. When he was finally deposed, in 1874, he had spent $40,000,000 and left the city $27,000,000 in debt.

Shepherd then returned to the plumbing business, but failed within a year for $1,000,000. Again he went to work, redeemed his fortune, and paid off his creditors. In 1879 he went to Mexico, where he bought land at Batopilas and developed valuable mines. He started eleven different companies and again became several times a millionaire. Establishing himself upon a beautiful estate, he surrounded himself with princely magnificence.

His estate is conservatively estimated at $6,000,000 by mining men who have a good knowledge of his mining operations and holdings in that section of the state of Chihuahua.

The first time he came back to Washington after an absence of twelve years he received a triumphal reception such as used to be tendered to victorious generals when they returned to Rome. The entire city was illuminated; there was a flag on every house; Pennsylvania avenue was blazing with fireworks as he was escorted by a military and civic procession from the station to his hotel, and the tears rolled down his broad cheeks as he saw the people who had cursed him when he went away shouting a cordial welcome. That change in public sentiment, however, came too late for more than Shepherd's gratification. He had too much human nature in his constitution to permit him to come back and live among the people who had ruined him and driven him away. So he went back to Mexico and has remained there ever since.

The men who hated him most bitterly and did him the greatest injury are those who have gained the largest wealth from the improvements he made at the national capital, and all they can do now to compensate him is to erect a monument in his honor.

The Western States

Office: 58-64 N. Jefferson St., Chicago. Telephone: Monroe 816.

ELMER CRAWFORD, General Manager. Frank P. Keeney, Representative.

Chicago Trade.

ACETYLENE GAS FIXTURE CATALOGUE OUT.

The new catalogue of acetylene gas fixtures and supplies of R. Williamson & Co., 52 Lake street, Chicago, is now ready for distribution. They claim that it is the most complete catalogue for acetylene dealers that has ever been placed on the market. It enables one to buy their entire outfit from one concern. They will be glad to mail it to any one upon application, if you mention this journal when you write.

A HANDSOME NEW CATALOGUE.

The American Radiator Co., 40 Dearborn street, Chicago, have just issued another of their characteristically neat catalogues. Those who are acquainted with the catalogues so frequently issued by this firm know that the standard is the highest, so when we say that this new one is up to the standard, one can easily infer that it is a beauty. The catalogue is mailed to the trade in a handsome envelope, covered with the "Ideal Clover." The catalogue itself, containing fifty pages of fine enameled paper, has clearly defined cuts of their several factories, as well as a large variety of the Ideal boilers and American radiators made therein. Extensive price lists, as well as a telegraph code to be used in ordering their goods, all tend to make the catalogue a complete production. It is bound in a cover of dark grey and, all in all, it is well worth the approval which it cannot fail to receive. Any one in the trade who has not already received a copy would do well to write early, mentioning DOMESTIC ENGINEERING, and ask for one.

THE CLOW CATALOGUE.

We are in receipt of the Clow catalogue, concerning which there has been so much said and from which so much has been expected. It is a book of 841 pages and bears evidence of a most detailed study on the part of the compiler and a thorough knowledge of the needs of the trade. There are some little points about it which are particularly interesting, such as the special monogram cover-lining paper, in which the Clow trade mark is cleverly used in the design. This trade mark of C in a circle is stamped all over the book and there is not the least possible chance of anyone failing to discover it.

The steam section of the catalogue is contained in the first 414 pages, while the plumbing section occupies the remaining portion of the book. To enumerate the contents of the catalogue would be to enumerate all goods used in water and gas work, by railroads, contractors, plumbers, steam and gas fitters. The book is divided into departments and each illustration in these departments is specialized by an initial letter and a number. For example, the fitting section of the catalogue is known as "B" and there are 866 numbers illustrated.

We would call especial attention to the character of the illustrations in the book. The catalogue sent us is by no means an edition de luxe but the illustrations of the baths are certainly of the very highest artistic type. A special feature of the catalogue is the series of bath room designs, the fixtures approximating a cost running from $1,008 down to $136.50. We believe this is a feature which will be found useful by master plumbers who desire to show prospective customers what can be done with a certain amount of money. There are some new designs in shower baths both individual and in ranges. Another feature is baths for special purposes such as hospital, electric, hydro-therapeutic, massage and other purposes. It is doubtful if any more artistic work in engravings illustrating plumbing fixtures, has ever appeared. If any of our readers have not availed themselves of our previous suggestion to make application for this catalogue, they should do so at once. They will find it of the very widest possible use.

Detroit.

By Major E. P. Bancroft.

A PROGRESSIVE YOUNG COMPANY.

On a recent visit to the Eagle Brass Works at 222 Elizabeth street, E, we were surprised and pleased to find that since our last visit the capacity of the concern had been doubled, and that their orders were crowding them to their limit. This concern is managed by young men who have worked their way up from the bottom, thoroughly understand every detail of their business, and are not afraid of work. They now employ forty hands and will soon have to enter larger quarters, as every inch is now utilized.

We were here shown an improvement in patterns for small castings which we had not seen elsewhere. The pattern is made of aluminum, cast hollow, which makes it almost as light as wood and much more durable. These are arranged on a plate the size of the flask, with the channels for the metal connecting them, so that two or three dozen of the smaller articles are molded at one time, with the connections all ready for the pouring, thus minimizing the labor of the molder.

We were much impressed with the cheerful, pleasant looks of the men. They went at their work as if they enjoyed it. We mean to get at the secret of it on our next visit.

The company will soon issue their first catalogue, when we shall take occasion to again notice an enterprise which we feel confident will soon be better known to the trade.

ANNUAL OUTING OF THE D. A. M. P.

It is doubtful if the "Frank E. Kirby," "The Flyer of the Lakes," ever carried a jollier crowd than on Tuesday, August 26, the occasion being the annual outing of the Detroit Association of Master Plumbers to Put-in-Bay Island.

The plumbers, with their friends, to the number of more than 300, boarded the "Kirby" and steamed away down the river. The day was an ideal one—the river as smooth as glass and the lake stirred just enough to reflect in myriad beams of light the ardent glances of the sun. The trip down was all too short, the time being spent, according to the inclination of each, but chiefly in conversation, singing and admiring the beautiful moving panorama spread out on either side. On the way down the following program was distributed:

1. Free-for-all eating contest at 1 p. m.
2. Bowling match, East Side vs. West Side. Captains, McGraw, Ryan, Comisky, Norris.
3. High diving contest. Deacons Morgan and Gray.
4. Long distance swimming contest. Lee, Wenzel, Benedict and Radcliffe.
5. Shooting the chutes on a bicycle.
6. All aboard for Wehrle's.
7. Prize waltzing. Michael O'Connor, past champion; E. J. Gibson, present champion; E. F. Thompson, prospective champion.
8. Stag cakewalk, by the world-renowned Jacob Zerga.
9. Homeward bound.
10. Long distance singing contest. Michael O'Connor, Louis Schwarz, Paul Wenzel. "Die Wacht am Rhine," and other national airs.

On landing, each one proceeded to smash the above program at his own sweet will—the only number rendered with great eclat was number one.

If there is another spot in America except Coney Island, where the "nimble nickel" is chased with greater alacrity than here, the writer hereof has not discovered it. Our party being all millionaires—as all plumbers are—proceeded at once to patronize every device visible. They filled up the nickel-in-the-slot machines until they would hold no more, they bought Mexican curios, made in Jersey City, they invested in Perry momentos, manufactured on the spot, they watched the bathers, and made remarks, more or less apropos to the occasion, they visited the caves, they—well, they took it all in, and enjoyed themselves as only a lot of "jolly good fellows" out for a holiday can. But the crowning event of the day consisted in photographing the party. President Teitze, after almost superhuman efforts, succeeded in herding the bunch in front of a saloon, there being no other background on that side of the island. The operator had brought his machine from the city—one which he thought would stand the test, having been tried on a police court crowd the morning after the 17th of February. If all the advice volunteered to the photographer and to each other with regard to the manner of posing and the proper management of the instrument was followed, that picture will be one of the wonders of the world.

At last the day wore away, and, as the "Kirby" swung to her wharf on her return trip, all were ready to embark. The trip, however, was filled in with music and attempted dancing, which last was a failure for want of room. At 10 o'clock a tired but happy crowd disembarked and was soon swallowed up by the great city.

To the officers of the good ship, "Frank E. Kirby," Captain A. J. Fox, Clerk James A. Barron, Engineer Harry Lewis, Steward William Portwood and Manager E. A. Dustin, the plumbers and their friends owe much for the watchful care and uniform courtesy which contributed so materially towards a day of almost perfect enjoyment.

Milwaukee Items

Milwaukee, Wis., Aug. 27.—E. T. Doyn, one of our prominent plumbers, was seriously injured while on his way home Monday evening, Aug. 25. The accident occurred to Mr. Doyn as he was alighting from the front platform of a street car, and in jumping off at a narrow turn his foot slipped off from the curb and was twisted and cut so badly that doctors feared that amputation must be resorted to. Mr. Doyn is a half brother to George S. Lyon, was raised in Chicago, served his apprenticeship there, but has been for many years active in the plumbing business in this city. All join in the hope that Mr. Doyn may recover.

THE MILWAUKEE PLUMBERS' PICNIC.

For a number of years the annual picnic of the Milwaukee Master Plumbers' Association was not the howling success that may be ascribed to the one just held. On Wednesday, the 13th, the members and their

families met by appointment and hied themselves to Twin Lakes, in Kenosha County, to spend the day and it was truly a picnic in every sense of the word. Everybody that attended praised the work of the committee on arrangements. All entered into the sport of the games and races as if all were boys and girls once more. But the event was not without forebodings at the outset. As the crowd increased at the depot in the morning the ladies trilled as they viewed the gathering clouds and as the mist increased many wished, for a time, they had not come. And this is what cheated DOMESTIC ENGINEERING out of a picture. But the sunlight came after the first few stations were passed and on alighting at the picnic grounds a count of noses showed three hundred and ten, which is the largest number that ever attended these picnics, and goes to show that friendship among the plumbers in Milwaukee is amalgamating, that social relations are better and that the craft is willing to forget business, with its hard knocks and individual acrimony, for one day each year at least. Twin Lakes is a beautiful place for a gathering of this sort and, strange to say, is in a direction, away from the usual haunts of Milwaukee people. One would not have far to go to get into Illinois.

Pewaukee was for some years the favored spot selected by committees to have a picnic, and for obvious reasons was not selected this year and may not be again. Several places were visited by the committee; among them, Cedar Lake, with its reputation for beautiful scenery and the summer home of several of Milwaukee plumbers is at this place, but the distance from the train cut some figure and when only one day is given up to a pleasure trip this makes a big difference. Taking everything into consideration, it was an ideal spot for a picnic, no one got wet, at least outside, plenty of fish were caught, prizes won by many and a good time was had generally.

Middle States.

PUSHES HOT AIR ENGINES.

C. P. Sykes, of Pinkney, Mich., contracting plumber, steam and hot water fitter, makes a specialty of pushing hot air engines in his territory with very good results. There is a hint in this for plumbers located in prosperous agricultural regions. Farmers of the present day have made so much money that they are able to improve their property and one of the most necessary adjuncts to a good farm is a good water supply and we believe that plumbers could interest their agricultural constituency very largely in improved methods of securing water supply and the hot air engine with circulating water systems for domestic purposes is one of the best possible means of securing it.

COLUMBUS (O.) NOTES.

A swift plumber, W. H. Seddon, of Mink & Seddon, was voted as the speediest plumber in the business. When the delegates to the recent meeting at Youngstown, O., were returning home, the Big 4 train stopped at Cresline, O., to transfer baggage, mail and passengers, Seddon and Esswein were delegated to get out and purchase refreshments at the hotel for the crowd. Seddon no more than got inside when Sam heard the signal to go ahead. He called for Seddon, who came out in time to see the Limited pulling out and puffing, I got your trunk, I got your trunk. The boys on the rear platform were laughing at Brother Seddon's plight. What was their surprise, on reaching Galion, some miles south, to see Seddons at the station waving his hand to the delegates. Well, Seddons had the laugh on the bunch. Seddons chartered an electric trolley car and beat the Limited from Miles into Galion.

INDIANA NOTES.

R. I. Hoyt, of Muncie, is passing the cigars. It's a boy and some day it will read R. I. Hoyt & Son.

J. A. Gallivan, of Muncie, was the successful bidder for plumbing the new addition to the Braun House, a residence for J. A. Over; also the Carnegie library.

Geo. Compton, of late with Central Supply Co., Indianapolis, is now located at Marion, Ind., and represents the Knapp Supply Co., Union City, Ind.

R. D. Lewis, the Broad street, Indianapolis, plumber, is in California with the K. of P. excursion and will make a tour of the northwest before returning.

KANSAS NOTES.

A. P. Elder, of Ottawa, Kan., has been paying a good deal of attention to acetylene lighting for some time past. He is manufacturing a line of generators of the overflow type for small installation, but has now taken the state agency for the Davis carbide feed machine and is making quite a success. He is installing a 200 light machine in the Deaf and Dumb Institution at Olathe and a 40 light machine in the new M. E. church at Wellsville. His gasfitter, W. A. Anderson, is now at Waverly installing a Liberty 20 light machine and a 40 light Davis. It is strange that plumbers do not take more interest in this branch of their business, for it is possible to greatly increase any plumbing business by the introduction of a good acetylene generator.

Groeber Bros., Lawrence, Kan., have purchased an Olds mobile. This firm is one of the most progressive in the West. They have numerous large contracts and they are intelligent bidders and therefore have a large profit in sight.

Paola, Kan., is about to loose their natural gas. Meters should have been applied twenty years ago to stop the waste.

A. J. Jones, a good plumber of Coffeyville, has joined the Kansas Master Plumbers'

A TIME-WORN PRACTICE BROKEN OVER.

The Master Plumbers' Association, Grand Rapids, Mich., has taken a decided stand in relation to figuring contracts for competing bids. This action is so different from the time-worn practice that DOMESTIC ENGINEERING takes great pleasure in making it public. It is the purpose of the association to enforce this action with no exceptions or deviations. A circular letter has been sent to all architects and building contractors, which reads as follows:

At a meeting of the Master Plumbers' Association of this city held to-day, August 28, 1902, the following resolution was introduced and passed by our Association:

"As a compensation for the time and expense spent in figuring contracts from plans and specifications, and the drawing of plans for plumbing, and such information as the plumbing fraternity is daily asked to give, which costs us in our business a large annual outlay, all of which benefits the owner and persons interested by giving them the benefit of the competing

When
Specifying
for a job of high-class
exposed plumbing, use
"BENEDICT-
NICKEL"
SEAMLESS TUBING.
When NEW, its brilliant silvery surface is not surpassed by any nickel plated tubing.
When OLD, this first appearance is maintained.
It will not wear 'brassy", because there is no brass to be exposed—it's "White Metal Clear Through". The bright nickel lustre is easily restored by an occasional rubbing.
PRICE LIST AND TABLE BOOK
Prices and tables are given in our "Price List and Table Book". You may have this book free. It also contains many useful tube, sheet and wire tables of copper and brass, of which we are among the largest manufacturers.
BENEDICT & BURNHAM MFG. CO.
WATERBURY, CONN.
NEW YORK, 253 BROADWAY.
BOSTON, 172 HIGH STREET

bids, we shall, beginning September 1, 1902, cover this cost by making a mimimum charge of two per cent (2) on the gross amount of each and every contract figured, whether from the architects' plans and specifications, or plans and specifications furnished by owners or ourselves. Our bills for these charges to accompany each bid submitted to us. The successful bidder not to receive compensation."

A card has been prepared which each master plumber who is a member of the association will hand to all applicants for bids. This card reads as follows:

"To cover the cost we are put to in figuring contracts for competing bids, the Master Plumbers' Association of Grand Rapids have agreed to make a minimum charge of 2 per cent on the gross amount of each contract figured, payable on delivery of bid, the successful bidder not to receive any compensation.

"This agreement to go into effect September 1, 1902.

"Master Plumbers' Association of Grand Rapids."

The Glauber Brass Mfg. Co's. New Model Factory.

Through our special correspondent at Cleveland, Ohio, we have come in receipt of particulars in regard to a real estate transaction just consummated by the Glauber Brass Mfg. Co. whereby they have come into possession of an entire square of real estate covering a tract of three and one-half acres of land which was purchased by them for a new and one of the most up-to-date and modernly equipped brass manufacturing establishments in the United States.

For some time past this well-known firm has been negotiating for a new site for the erection of a plant which it is their desire should be second to none in the country, and after considerable looking around they have decided to locate in what is known as the Eastern District of the city and within fifteen minutes' ride from the heart of the city.

In speaking with our correspondent Mr. I. N. Glauber of the above firm stated that this section of the city is very conveniently located for the receiving and shipping of goods and a better, cleaner, or more convenient location could not have been selected.

The buildings will cover a floor space of 150x350 feet, and the foundry, which will be fireproof in every respect, will be a seperate structure 80x150 feet and built entirely of stone, brick, iron and glass. We are told that the entire working departments will be located on the ground floor, thereby doing away entirely with the expense of conveying goods from floor to floor, as is customary where a three or four story building is used. The buildings will be constructed of pressed brick and stone, of beautiful architecture, well lighted and ventilated, and will be built with every possible improved feature and facilities for the manufacture of the highest grade of brass goods known in the market. A separate boiler and engine room will be built for the purpose of generating their own electricity for light and power, and individual motors will be used for furnishing the power for the different departments. One of the most prominent features of this new factory will be the smoke-stack, which is to be as large, if not larger than any in the city of Cleveland.

The offices of the building will be large and spacious, divided so as to accommodate in one large room the bookkeeping department and the clerical force, and will be fitted up with two large steel vaults to contain the many books, records, blue prints, designs, master patterns, etc., pertaining to the business. There will also be private offices fitted for each member of the firm, and separate rooms for the exclusive use of their traveling men are also arranged for. We are also told that arrangements have been made towards bettering the condition and conveniences for the working men who may be employed in this factory, that a separate department has been provided for them which will be fitted up for dressing rooms, shower baths, library and auditorium, where the men and their ladies may come and enjoy their semi-monthly dances, which they have been giving from time to time.

Very little has been said of the rapid growth of this enterprising concern. Starting in 1890 at 6 Champlain St., in a single room 20x40 feet, it was but a short time until they found their business increased to such an extent that they were compelled to seek larger quarters, and consequently moved to 86 and 88 Rover St. in 1892. This was a large four-story building, but in a very few years this building was also too small, and their rapidly growing business compelled them to again arrange for another four-story brick building, located directly across the street and connected with the old plant by a large two-story iron bridge. The great demand for their high grade brass goods continued and it was but a short time thereafter that it was very evident that a still larger factory must be provided for very soon to meet the demands and requirements of their constantly increasing trade, and it was this fact that now prompted them to negotiate for their new location above described.

We understand that it is the intention of this firm to very materially increase their already large line of goods as soon as they are permanently located in their new quarters, which will be about Nov. 1, and that the rigid policy of manufacturing only the highest possible and most perfect grade of brass goods will be carried out to the letter as heretofore. We congratulate the Glauber Brass Mfg. Co. upon this move, and we feel that their many friends in the plumbing trade will join us in our best wishes for their welfare.

Wallace L. Pierce, Pres.
Geo. B. Little, Vice-Pres.

Osborn B. Hall
Gen'l. Manager Mechanical Dept.

Geo. T. Coppins, Sec'y.
Geo. H. Graves, Treas.

Walworth Manufacturing Co.

Tools and Supplies

FOR STEAM, WATER AND GAS USERS

Established 1842

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128 to 136 Federal Street
Boston, Mass., U. S. A.

New York Office, Park Row Bldg.
Factory, South Boston

Dominion of Canada

Montreal Office: 301 St. James St. Tel. Main 2018. E. G. O'Connor, Representative
Toronto Office: Room 44, National Trust Co.'s Building, 20 King St. East.
Victor H. Ross, Representative.
Quebec Office: 96 St. Peter St. ELMER CRAWFORD, General Manager

Toronto.

LARGE STEAM HEATING PLANT.

Messrs. Fiddes & Hogarth have secured the contract to install the steam-heating plant of the large new eight-story warehouse of Adams Bros., saddlers. The plant will connect with the engine exhaust. They are also attending to overhauling the heating system of Beardmore & Co.'s warehouse on Front street east. The plumbing and gasfitting in three new dwellings on Sumach street for Alderman Lamb is also being done by this firm.

SCHOOL WORK.

Kenneth J. Allison, the Yonge street plumber, reports a great deal of work going on among the numerous schools and colleges in North Toronto. He has just finished laying 2,000 feet of 4-inch water main from the preparatory school to the main building of Upper Canada College, which will be used ordinarily as a water supply pipe and also, if needed, for fire protection. Mr. Allison is also working on the plumbing in an addition to Havergal Hall, as well as other work in the Bishop Strachan School and the Moulton Ladies' College.

THE BUILDING BY-LAWS.

The movement to have the building by-law revised, brought about chiefly by the prompt action of the city architects, has resulted in the appointment of Mr. A. Frank Wickson, the well-known architect, to act in conjunction with Chief Thompson of the fire department and the city commissioner, in the revision.

These gentlemen will consider the best means of regulating the building in Toronto and consult with the city solicitor as to the drawing up of the necessary ordinance.

WILL LAY NEW SEWERAGE SYSTEM.

The city engineer recently sent out circulars to the residents asking whether they were in favor of a separate sewage system, using bacteria beds and septic tanks, "it being considered inadvisable to turn crude sewage into the lake," to quote the circular. A great majority of the property owners favored the new system, and so the engineer will, at the next meeting of the works committee, recommend that it be installed at once on the local improvement plan. The cost of the system will be about $40,000 and the charges of $1.66 per foot frontage or 20½ cents annually for ten years.

THE J. F. PEASE COMPANY.

One of the largest exhibits in the main building of the exhibition is that of the J. F. Pease Furnace Company. It comprises eighteen hundred equal feet of space, and contains a complete line of the wellknown Economy Hot-Water Boilers, combination heaters, warm-air furnaces; also the Ideal heater and ventilator for public schools and churches. This is a new system of heating and ventilating, and requires no excavation. A great many members of the outside trade have called at the firm and they are cordially received by C. F. Pearce.

A SPLENDID EXHIBIT.

The Jas. Morrison Brass Co. have a most interesting exhibit in Machinery Hall at the Fair. Among the articles displayed are the Hancock inspirators, locomotive injectors, steamship telegraph gongs, and ship compasses, with a full and complete line of engineers' supplies and electrical chandeliers. A special feature of the exhibit is a bathroom thoroughly equipped in the latest improved style, with folding shower in connection with bath tub, to which they call special attention. This exhibit will be of much interest to all the users of steam and electrical goods and plumbers' supplies.

THE ANNUAL BALL GAME.

The annual baseball game between the members of the Master Plumbers 'Association and members of the Supply Association took place at Long Branch on Saturday August 30 and never for a moment ceased to be a thrilling and eventful occasion. The game was witnessed by a large gathering, and was possessed of more "features" than any game ever played by International League teams. The record of a long list of victories held by the Master Plumbers was broken at last by the supply men, who managed in seven innings to make some 14 runs, not counting those made in the direction of the pavilion. There were no errors in the game, for every play did somebody good. The team which represented the plumbing interests, and which was made up of prominent members of the trade, was in charge of Mr. Wm. Mansell, while Mr. "Andy" Mann, of the Jas. Robertson Co., looked after the interests of the team from the Supply Association. Their duties in this connection not being of the most onerous nature, these gentlemen also constituted an Entertainment Committee, and did a great deal to make the day pleasant for the members of the respective organizations. Mr. Geo. Nicholls was a very efficient umpire, and Mr. Anthes and Mr. McMichael, of the Jas. Robertson Co., were said to be honorary referees. We forgot to mention that the plumbers made eight runs. The reason that they did not make more was afterwards explained by Kenneth Allison, who said that it had been the intention to allow the supply men to win so that interest in the games would be maintained.

The teams and score were as follows:

Plumbers Association—Pitcher, P. Hayes; catcher, F. Maxwell; first base, W. Mansell; second base, Mr. McMullen; third base, K. Allison; short stop, Geo. H. Cooper; center field, L. G. D. Adams; right field, J. Richards; left field, Geo. Clapperton.

Supply Association—Pitcher, John Goddard; catcher, Bert Crellar; first base, F. McCallum; second base, P. McMichael; third base, H. Porter; short stop, Harry Foster; center field, E. Bailey and H. Kolmeyer; right field, W. J. Telford; left field, E. J. Brewer.

Plumbers' Association	0	1	3	0	1	2	1	—	8
Supply Association	3	1	5	3	0	0	1	—	13

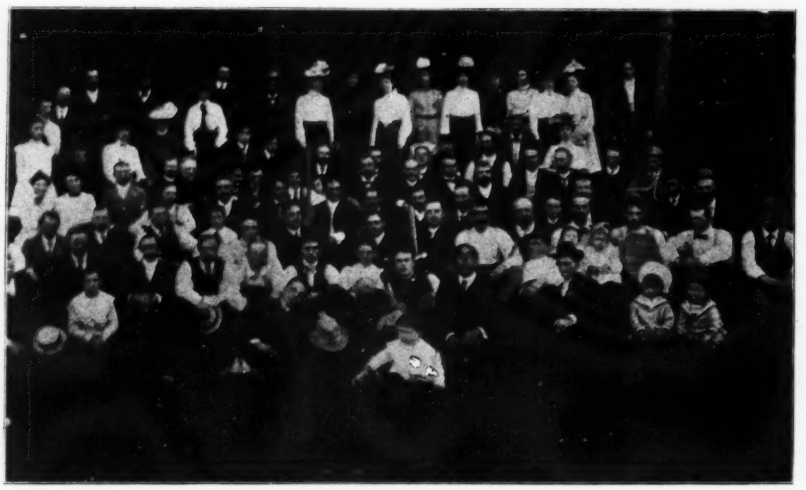
OTTAWA PLUMBERS' STRIKE.

About sixty-five members of the local branch of the International Union of Plumbers and Steamfitters went out on strike on Monday. The point at issue is wages. The minimum wage, according to the existing scale, is 22½ cents, and the plumbers ask that this be increased to 25½ cents. The strikers held a meeting on Monday night, but were mum as to what was done at it.

Montreal.

A NEW PLUMBING HOUSE.

Messrs. Guilbault, Quillet and Desjardins, who have been employes for some fifteen years of the well-known establishment of Blonin, Desforges & Latourelle, have formed a partnership and opened a shop on their own account at 933 St. Lawrence street. Their motto is, "Up-to-date plumbers."



Toronto Master Plumbers and Supply Men at the Long Branch Base Ball Ground, August 30th.

PRIVY PITS TO BE ABOLISHED.

During the course of last year the city council of Montreal passed a by-law abolishing privy pits within the city after the first day of May, 1902. Since the latter date the city officials have been endeavoring to have the by-law put into effect, but have met with strenuous opposition on the part of property-owners who have them on their premises. They can find tenants for their houses even with these unsanitary inconveniences, and they shirk the duty and expense of fitting up their properties with modern water closets. The latest claim put forward is that this by-law is not retroactive, and that privy pits in existence before the by-law came into force cannot be interfered with. Mayor Cochrane has been so besieged with applications for exemptions upon this ground that he has finally submitted the question to the city law officers for an opinion. The clerk of the Recorder's court, Mr. Biennenne, was instructed to lay the matter before Recorder Poirier and Mr.

L. J. Ethier, the city attorney, and reports their opinion as follows:

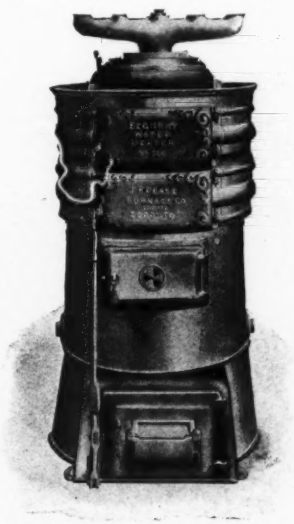
"Both are of opinion that the by-law as it stands is clear and that the question of retroactivity cannot be raised. No case on this point has yet been decided on its merits, but any future decision may be relied upon to be in the sense of section 30 of by-law 268, and that is that existing cesspools in yards cannot be tolerated after May 1, 1902."

The mayor has, therefore, determined that the by-law must be enforced, and that the pits must go, as they are a nuisance and a menace to the public health. As there are something like 800 of them in the city, there should be lively times soon in the plumbing business.

Canadian Business Notes

THE ECONOMIC HEATER.

The accompanying cut illustrates the "Economy" water heater manufactured by the J. F. Pease Furnace Company, 189-193 Queen street, East, Toronto, Ont. The "Economy" has given entire satisfaction wherever it has been installed. It is simple



in construction, compact and reliable, made of the best material and workmanship. It is in every way a successful heater. Anyone who is thinking of buying a heater should write for booklet and information, which will be gladly sent upon application if you mention DOMESTIC ENGINEERING when you write.

A WELL KNOWN WARM AIR AND COMBUSTION FURNACE.

I. E. Shantz & Company, Berlin, Ontario, handle one of the best known warm air and

combustion furnaces in the Dominion. They manufacture the celebrated Howard furnace, which is made in five different sizes, and is all cast iron. Some of its chief characteristics are its low down features, the long fire travel and economy. The cut herewith presented will give a good idea of this excellent furnace, concerning which they will be glad to answer any queries, if you write, mentioning DOMESTIC ENGINEERING.

Notes Industrielles du Canada.

IMPORTANT CONTRAT.

La maison Amiot, Lecours et Larivière a obtenu en sous-contrat la fourniture de tout le fer qui sera employé dans la construction des usines du Pacifique à Hochelaga. Pour donner une idée de l'importance de ce contrat il suffit de dire que la première commande, reçue hier par MM. Amyot, Lecours et Larivière comprend le chargement complet de dix chars, et cette première commande ne comprend que les clous, les boulons, les écrous et autres menues pièces. Il y aura encore à venir le fer pour la charpente de la toiture, les tuyaux d'égouts, les conduits d'eau, etc., qui formeront des chargements beaucoup plus considérables.

UN PLOMBIER ENTREPREMENT.

M. Wilfrid Chaussé, 213 rue Mont-Royal, est un plombier des plus entreprenants de notre ville, et les contrats qu'on lui octroie, pour la plomberie et les appareils à chauffage, etc., sont toujours exécutés avec le plus grand soin. Il vient de terminer le contrat que M. Mercure, lui avait confié pour la jolie résidence en pierre, à trois étages que M. L'Archevêque se fait construire Avenue Delorimier, pour la pose d'une fournaise Nouvelle Star No. 3 de la Star Iron Co., avec bouilloire en coppe, des radiateurs Oxford, des bains en fonte émaillés Standard, de la Standard Sanitary Mfg. Co., de Pittsburg, Pa., des cuves en ardoise et en fonte émaillées achetées de la maison F. W. Webb Mfg. Co., des W. C. Richelieu. M. Chaussé tient aussi un grand magasin de ferronneries et de peinture, etc.

NEUF NOUVEAUX LOGEMENTS.

Les M. M. Navert et Lauzon, du No. 184 de la ure St. Antoine, ont obtenu le contrat pour la plomberie, etc., de trois cotés de maisons, de trois logements chaque que M. M. Marotte et Leblanc, font bâtir rue Prince Arthur, coin de la rue Hotel de Ville dont M. Jos. Sawyer, l'architecte bien connu a fait les plans, ce contrat comporte pour la pose de neuf fournaises à eau chaude Daisy, manufacturées la maison Warden King & Son, de Montréal, ainsi que neuf bouilloires, neuf bains émaillés "Crown" de la Standard Mfg. Co., neuf W. C. achetées de la maison Star Iron Co., des radiateurs "Safford" de la Dominion Radiator Co., de Toronto, Ont., six cuves émaillées, des "Trap," Ideal, etc.

NOUVELLE CONSTRUCTION.

M. E. Lespérance, de la rue Ste. Catherine, est à se faire construire 16 logements, sur la rue Massue, dans lesquels il installe les meilleurs appareils de chauffage et d'éclairage, des fournaises à eau chaude "Buffalo," de la maison H. R. Ives et Cie., de Montréal, des radiateurs "Safford" de la Dominion Radiator Co., de Toronto, Ont., des bains émaillés, des gazeliers, etc.; achetés de la maison, "Montreal Plumbers' Supply Co."

A QUEBEC.

Le département de la milice est actuellement a'faire subir d'importantes améliorations à l'arsenal des anciennes casernes de l'artillerie. Dans la plus ancienne des bâtisses, les machines ont été renouvellées et l'on est à construire une nouvelle bâtisse dans le parc. Cette construction, en fer, mesure 120 pieds par 70, et il y sera donné de l' emploi à plusieurs centaines d'ouvriers additionnels. On est aussi à construire une fonderie sur la rue D'Auteuil, en arrière des anciens magasins militaires, dont les dimensions seront de 155 pieds par 55; l'on s'attend que les travaux en seront complètés avant la chute des neiges.

DELORIMIER.

Le Conseil de Delorimier a décidé de construire des canaux d'égouts sur les rues Chaussé et Bordeaux. De placer deux bornes fontaines en face de la manufacture McCready, d'éclairer la municipalité à la lumière électrique dans tout son étendue.

REPARATIONS CONSIDERABLES.

La "Montreal Light, Heat and Power Co." a décidé de convertir sa bâtisse de la rue Ottawa en une usine pour la réparation d'appareils électriques. Elle a demandé à l'inspecteur Chaussé un permis pour ces travaux qui couteront $10,000.

UN NOUVEAU THEATRE A QUEBEC.

Il y a eu réunion spéciale des directeurs du nouveau théatre, au bureau d'affaires de l'hon M. Parent, à la Basse-Ville, et les contrats suivants ont été accordés:

Travaux électriques, la compagnie Slade; toiture, M. C. T. l'Heureux; appareils de chauffage à la vapeur et travaux de plomberie, M. M. Vandry et Matte; peinture et pose de vitres M. B. Léonard.

LE DEPARTMENT DES INCENDIES.

Il y a eu le 11, réunion du comité des incendies, sous la présidence de l'échevin Robertson.

On a adjugé à M. H. K. Martin, le plus bas soumissionnaire, le contrat pour 8,000 pieds de boyaux à 70cts le pied.

Les autres concurrents étaient la compagnie Canadienne de Caoutchouc, et la "Gutta-Percha and Rubber Co."' de Toronto.

UN COLLEGE ET UN COUVENT.

M. Napoléon Rousseau, président, et M. le Dr. J. A. Dufresne, membre de la commission scolaire de Shawinigan Falls, sont arrivés en ville le 6 dans le but de conférer avec les directeurs de la "Shawinigan Falls Light and Power Company," pour l'obtention de terrains destinés à la construction d'un collége et d'un couvent. Ils ont été reçus par M.M. J. A. Aldred et Laflamme, qui ont donné, au nom de la compagnie, le terrain pour l'érection d'un couvent; le terrain du collége a été vendu à un tiers du prix courant des terrains, à Shawinigan. Ce collége sera situé sur les 6me. et 7me. rues et les rues Broadway et des Cèdres. Ce terrain contient quatorze lots évalués à $200 chacun.

M.M. Rousseau et Dufresne sont partis pour Québec, où ils vont s'entendre avec le département de l'instruction publique pour la construction de ce couvent et de ce collége.

LE MOUVEMENT MANUFACTURIER A SHERBROOKE.

Le mouvement manufacturier semble prendre de l'élan dans la métropole des Cantons de l'Est. La nouvelle compagnie "The Imperial Pneumatic Tool Co." dont les usines seront construites dans notre ville, a pour objet de manufacturer des appareils et machines pneumatiques et autres articles semblables et y avant rapport, acquérir des patentes, des immeubles et pouvoirs d'eau nécessaires pour les fins de la dite compagnie.

D'autre part les directeurs de l'usine Jenckes demandent au conseil de ville d'être relevés de leurs obligations envers la cité pour leur permettre de prélever du nouveau capital qui sera utilisé pour les agrandissements considérables projetés.

—Les directeurs de la Compagnie de Papier et de Pulpe de Brompton Falls font construire une construction pour chaudières à vapeur d'une dimension de 65 pieds par 130. Les murs auront une hauteur de 25 pieds et la cheminée 125 pieds.

M. C. A. Reeves, architecte, prépare les plans et devis pour une maison en bois et brique, formant 3 logements, que M. S. Beaudry fera ériger rue Frontenac.

LATE NEWS OF THE WHOLESALERS.

Why Not Have a Standard?

Master plumbers frequently complain of variation in the size of threads and in the size of the stems on ball cock floats. They frequently desire to purchase ball cocks without floats and to replace floats where they are worn out, and they find considerable variation in the size of threads and wire. Would it not be a good idea for the supply association to take this question up and endeavor to have a standard so that all stems will be alike?

Charging For Boxes.

Manufacturers of closets have begun to charge extra for boxes and packages for closet fixtures. This went into effect with some manufacturers on September 5. It is a move in the right direction. Manufacturers ought to recognize all of the fixed charges connected with their business and allow for them either in the prices of their goods or, if that is not feasible in extra charges. The contracting plumber will pass them on to the customer who ought to pay them.

A New Enterprise.

E. A. Marsh, inventor of the Marsh steam pumps, manufactured by the American Steam Pump Co., Battle Creek, Mich., and for the last four years with the Ideal Mfg. Co., of Detroit, and inventor of their Volumeter, has entered into business under the name of the Marsh Valve Co., Ltd., at 45-49 Grand River Ave., in Detroit. Mr. Marsh will first place upon the market a pressure regulating ball cock, which is constructed upon an entirely new mechanical principle and on which he has a basic patent. Later it is his intention to manufacture a line of reducing and pressure regulating valves for water, steam and air. Mr. Marsh was induced to study the ball cock question by many interviews with master plumbers from all sections of the country who requested him to give them a perfectly reliable ball cock. Some of them went to the extent of stating that there were 130 ball cocks on the market and not one good one. We are not inclined to agree with this statement, but we join with all of the trade in welcoming a thoroughly reliable ball cock on the market. Mr. Marsh will be pleased to receive correspondence in relation to his goods.

The Clow Forces.

The annual convention of the salesmen of Jas. B. Clow & Sons, Chicago, was held from Sept. 1 to 3. On this occasion a photograph of the salesmen and house attaches was taken. We take a great deal of pleasure in presenting a copy of this photograph to our readers. Recognizing that a photograph is of very little use without a guide to the people in it, we have prepared, through the kindness of P. J. Madden, the following list of gentlemen who appear in this picture. The group should be read from left to right and in the lower row the following appear in the order given:

U. G. Reynolds.
J. J. Parker.
H. S. Powell.
P. J. Madden.
L. E. Woessner.
M. R. Osburn.
J. C. Jones.
J. L. Ponic.
J. M. Johnson.
W. E. Clow.
D. L. Hanson.
F. H. Grier.
H. S. Collins.
W. R. Marshall.
J. S. Robertson.
J. A. Duggan.
J. M. Warren.
W. B. Bastian.
E. A. Gage.
C. W. Austin.

In the upper row the following are the names of the gentlemen as they appear:

L. J. Elliott.
W. D. Beers.
W. A. Beers.
Geo. W. Bowers.
W. E. Wood.
C. F. Ames.
H. P. Finney.
W. S. Eliot.
F. F. Rowell.
H. D. McDonald.
F. E. Hutchins.
M. F. Yates.
L. Rademacher.
J. B. Clow.
W. B. Collins.
J. McLean.
B. T. Kellett.

James B. Clow & Sons'¡Annual Salesmen's Convention.

F. P. Bassett.
T. C. Erringer.
E. D. Holmes.
J. F. Coyle.
F. A. Hamilton.
W. P. Connell.
C. R. Clow.
A. H. Fulton.
Yates A. Adams.
G. O. Stafford.
W. J. Wood.
F. L. Rice.
W. Z. McFarland.
W. J. O'Day.
E. F. Kellogg.
J. A. Fitzpatrick.

Utica Heater Co.'s New Catalogue.

The Utica Heater Co., of Utica, N. Y., with branches at 108 Beekman street, New York City; 24 India square, Boston, and 33 Dearborn street, Chicago, have just issued an exceedingly neat catalogue and price list

of their Superior warm air furnaces and Utica heaters, Keystone boilers and Imperial sectional boilers. This catalogue contains numerous half-tone engravings of these heaters and boilers with unusually complete descriptions.

Thousands of their Superior steel furnaces have been sold in all parts of this country during the past sixteen years. They were designed with a special view of meeting the wants of the trade for a high class powerful heater, yet an economical and durable hard coal furnace. It is made with an extra deep ash pit, Smyth revolving and dumping grate, sectional flanged firepots direct dust escape to chimney, large steel combustion chamber, immense radiating surfaces and positive indirect draft. In this connection we ought perhaps call special attention to their new Superior Dome furnace fitted with double feed doors to meet the demand of customers in those sections where wood is largely used for fuel.

Another furnace to which prominent space is devoted in this catalogue is their New Superior furnace, with extra heavy castings, which is specially designed to meet the requirements of the trade from an exceptionally heavy, substantial and durable heater of the low down pattern, mounted with either steel plate or solid cast iron radiator.

Their extensive and complete line of Utica heaters were designed to meet a large demand from the trade for a moderate priced first class line of furnaces. They are made with steel or cast iron radiator, for hard or soft coal, natural gas or coke. They are constructed with extra large sectional firepots, corrugated cast iron combustion dome with large radiating surfaces, are low down in height and fitted with their new improved revolving grate. The fact that they are made for soft coal have caused them to be in an enormous demand for the last few weeks.

Their Imperial sectional boilers for steam and hot water have several new and excellent features. The fire surface is so formed and placed as to utilize, in the most economical manner the intense heat from the product of combustion. The spaces between overhanging surfaces form a large gas chamber in which the gases are thoroughly consumed, and the sections are so arranged as to give a return flue construction.

The Keystone boiler for steam and water, which is also fully illustrated and described in this catalogue, was designed to combine all of the desirable features of cast iron boilers and steel tubular boilers with none of the bad points of either. The fire surface is so formed as to utilize in the most economical manner the intense heat.

Last but not least we feel we ought to call special attention to an excellent essay on "The Importance of Ventilation," found in the front of this catalogue, which we are sure will prove of considerable value to the furnace dealer, who reads it.

Parties interested in any of these excellent heaters or boilers can obtain this catalogue by writing the manufacturers at their home office, Utica, N. Y. Kindly mention DOMESTIC ENGINEERING, when doing so.

Death.

MRS. RICHARD T. CRANE DEAD.

Eliza Prentice Crane, wife of Richard T. Crane, president and founder of Crane Co., died at the summer home of the family at Lake Geneva, Wis., Saturday, September 13. Mrs. Crane's death was not unexpected, as she had been ailing all summer and had gradually grown weaker, her advanced age, almost 70 years, being the principal cause of her decline. She was born in Lockport, N. Y., January 16, 1833, but had resided in Chicago nearly all her life. Mrs. Crane was widely known to residents of the South Side and the Lake Geneva summer colony. She was the second wife of Mr. Crane and leaves no children. The funeral was held at Lake Geneva Monday afternoon, Rev. William J. Chichester, of the First Presbyterian Church of Chicago, officiating.

Mr. R. T. Crane has the sympathy of trade in his bereavement.

PLUMBERS SHOULD PUSH SPECIALTIES.

SOMEONE has given as the secret of the tremendous success of the packing industry in the city of Chicago the fact that the Chicago packers have learned the knack of utilizing every portion of the hog except the squeal and that they are hard at work on a scheme to put the squeal on a dividend paying basis. Certain it is that there is almost no waste in the pork packing business as conducted today. From the greasy water in which the animals are washed, and which was formerly turned into the sewers, there to prove a never ending source of trouble, it is said that the packers now reap a profit of nearly a quarter of a million dollars annually. To be sure they had to go considerably outside of their old line of business and become soap manufacturers to do it, but they have made a success of the venture and what was before only troublesome refuse has been turned into a profit producing commodity.

Here many other examples might be cited all pointing the same moral, viz., that the man who makes his business yield all there is in it, who, in other words, "gets all that's coming to him," is the man who makes the big success in the business world. Take the much maligned department stores, for instance. Their success is due not so much to the fact that they attract the crowd by exaggerated advertisements of wonderful bargains as to the fact that they offer to the busy shopper an opportunity to buy a number of widely diversified things at the least possible expenditure of time and trouble. And the explanation of this lies in the fact that a record is kept of all inquiries for goods which it is found are not in stock, and if there seems to be even a small market for these goods they are promptly ordered and put in stock. No question is asked as to whether this or that article properly belongs to any particular line of business or whether the profit on it is large or small. It is enough that the public apparently wants it and that it can be handled on at least a small margin of profit. As a result the public has come to believe that it can find anything under the sun in a department store, and when in want of anything from bibles to chewing gum will head straight for a department store instead of trying stores perhaps nearer at hand where such articles may or, more probably, may not be found.

Now, to give the moral its personal application. The master plumbers of the country rightly insist that they represent the industry of plumbing in their respective localities, and that as merchant plumbers, carrying a line of plumbing supplies and having money tied up in the business, they are entitled to protection at the hands of the manufacturers and jobbers of plumbing supplies. With the general proposition that it is to the best interest of the whole trade that goods should be put on the market through the regular channels and that the interests of each branch of the trade should be protected by the respective branches, we believe everyone agrees. The trouble all arises over the arrangement of details. So far as the manufacturers of staple goods are concerned, then, they have on the whole every reason to confine their sales to the established channels. But is this true of the manufacturer of specialties and new inventions? Can he safely leave to the plumber the work of introducing his specialty to the public or even of giving it a fair chance to sell itself once the demand for it has been created? DOMESTIC ENGINEERING is so often in receipt of letters like the following that the writer hesitates to give an affirmative answer:

To the Editor of Domestic Engineering.

SIR: We regret having occasion to bring such a letter as the enclosed to your notice. We endeavor at all times to do business through the plumbers and have many good customers among the trade. This matter, however, refers to the way in which our efforts to start new customers among plumbers are reciprocated. After considerable expense and effort, we induced two plumbing firms in ———— to agree to place one of our heaters upon exhibition in their show rooms and to make an effort to push their sale. We advertise in many mediums other than trade papers and receive many inquiries; the numerous inquiries received from ——— since we made a deal with the two plumbing firms in question have been referred to one or the other of them.

The enclosed copy states the experience of an inquirer for our water heaters who was referred to these firms for further information and prices; a perusal of it makes it so self-explanatory that we need say nothing regarding it.

We have to do a certain amount of business to pay running expenses, to say nothing of anything more, and plumbers always kick if sales are made in any way except through their own hands. All we want is fair treatment, which we do not think we receive.

The above letter is from a manufacturer of instantaneous water-heaters—a device which one would naturally expect to find on sale in any plumbing store. The writer, it will be noted, expresses a willingness to make his sales through the trade wherever possible. The letter which follows shows how the plan failed in one city, and that apparently through no fault of the manufacturer, who had done everything in his power to give his agents the right start. The letter, which is from a lady, is substantially as follows:

GENTLEMEN: I write to say that if your instantaneous water heater is anything like the invention that you claim it is, it certainly would pay you to have at least one in the city of ————, properly connected so that people can see what it will do, and with some one who cares enough about introducing it to be ready to talk for it.

I have been interested in it ever since I first noticed the advertisement, but as our tank was connected with the kitchen range, we did not undertake to make any change, although that arrangement was far from satisfactory. But when we sold our house and decided to build a double house, I became interested again, especially as our natural gas has become so unreliable that we have to resort to other means of heating. In one of your letters you referred us to ———— and ———— as handling your goods. My husband called on ———— and asked to see your heater. They did not even show it to him, but called his attention to another, but told him that they did not consider either one very satisfactory. He was not as enthusiastic as I was; in fact, was investigating only at my suggestion, so did not go any farther. I, therefore, determined to go myself to the other place. I saw one of your heaters in the window as I went in. It was not connected with either water or gas, so there was no opportunity of seeing it work. I asked the young lady in charge if she knew anything about it. She said she did not; that they had never sold any and knew nothing about it, only that the manufacturers said it gave good satisfaction, but she thought as a rule that instantaneous heaters did not, but they had something that was perfectly satisfactory and took me back in the store and showed me an ugly little black furnace that one would have to kindle a fire of wood or coal in every time they wanted hot water. I was so disgusted I could hardly get out of the store and I thought you ought to know that your goods are not having a fair showing here. We are going to heat our house with hot water, and, of course, the furnace

that heats that can heat the bath, too, in the winter, but for summer I do not know what we will do. If your heater will do what you claim for it, you could not have a better field than ————, for the people here have had an abundance of natural gas for the past ten or twelve years and have had, in most cases, the burners directly under their tanks in the cellar, so that they have had hot water all the time at a very slight expense, but now all this has changed; the gas is so scarce that very few people, comparatively, are using it at all, and the question of how to have a constant supply of hot water at a reasonable price is a great one.

Undoubtedly this is an extreme case, and we are glad to recall that our correspondent stated at the beginning of his letter that he has many good customers among the plumbers, so that in all probability he is very well satisfied with the treatment which he is receiving at the hands of the trade at large, but it must be acknowledged that these letters do not speak very favorably of the progressiveness of the two firms under discussion, and we fear from the number of similar letters received that there are many firms in the business who are not making the most of their business opportunities by pushing the sale of goods of this class. The instantaneous water heater is not a toy or a plaything, but a time-tested apparatus, and owing to the fact that it is thoroughly advertised and appeals at once to the householder as a great convenience, it is meeting with a large and growing sale. If the manufacturers are inclined to give the master plumber a reasonable profit for handling these goods, there is apparently no reason why, if the plumber will show a little enterprise, he should not make a good many sales and a snug profit.

The same is true of many other lines now handled only by the most progressive plumbing firms. Speaking with the Chicago manager of the Cleveland Faucet Co. some time ago, the writer was impressed with the large field open to progressive plumbers in the installation of compressed air. The growing favor in which compressed air is coming to be held by patrons of barber shops makes it almost imperative that the barber put in compressed air apparatus or go out of business—and the plumber, if he is progressive, gets the job. Beer plumbing and bar work is a profitable field for the plumber who "knows how." Compressed air systems, whereby water supply may be laid on all over the house, make work for the plumber in country places not having city water pressure. And so on all down the line. A member of the entertainment committee at Atlantic City, whose hospitality is not forgotten, even if his name is, said that the most profitable investment he ever made was for a book on electric installation. His electrical business now nets him yearly several times as much as he makes out of his plumbing work.

The application of the moral is obvious. The man who doesn't wait for business to come to him, but goes after it, and who isn't always particular to keep to the old lines in his search after business, is the man who will have money in his jeans while the other fellow is spending all his time telling hard luck stories.

PLUMBERS PUSHING SPECIALTIES.

The above article, which was published in our Weekly journal September 13, has attracted some attention. Among the letters we have received on this subject is the following:

"To the Editor of DOMESTIC ENGINEERING.

"Sir:—You have a very interesting article in your issue of the 13th inst., in relation to the general subject of plumbers pushing specialties, and especially instancing the subject of Instantaneous Water Heaters.

"The experience of the manufacturers alluded to, is a common experience, we believe, among all manufacturers of these fixtures. Unfortunately, the situation is not quite so optimistic as you suggest, namely, that the case given is an exceptional one. We think we are quite conservative when we say, that at least 50 per cent of the trade do not give the question of instantaneous water heaters the consideration which it deserves, and most of those who do sell the heaters today, and who are perhaps, friendly to this system of heating, were forced into the handling of them by the aggressiveness of the manufacturer, and the persistency of the consumer in demanding these articles.

"Today we have the paradoxical situation of seeing a town where instantaneous water heaters are used as commonly almost as bath tubs, and only a few miles from this place you will find a town where none of them are sold.

"If you will visit the plumber he will state that he does not believe in instantaneous water heaters, and waves the subject out of discussion. Another man may tell you that he handled a few of so and so's heaters, and they never gave satisfaction.

"If you would call at the homes where the few heaters were installed, you would perhaps find that they were not connected up right, or they were not regulated right, or some little thing was the matter with them that a few minutes of common sense judgment would rectify. The heater is condemned by the owner, and by the plumber, and all along it has not been at fault.

"The master plumbers' association will say that the instantaneous water heater is a plumbing fixture, and should not be sold to gas companies, although in some places the gas companies are the ones who push the heaters, and the plumbers will have nothing to do with them. It is also a fact, of course, that these gas companies invite the opposition of the plumbers by selling them at a very low price, to get the gas consumed.

"This, manufacturers cannot help, and we are confident that if the plumbers would discuss the subject with the local gas companies, they would be perfectly willing to turn all the business over, or at least to maintain a profitable price in return for the enlistment of the favor of the plumbers.

"Rightly considered, the instantaneous water heater has almost as much place in the bath room, as the bath tub itself.

"We contend that it is frequently most desirable to install a range boiler for the general distribution of hot water, but that does not prevent the installation of the heater also, which serves the consumer when the boiler cannot.

"Very truly yours,
"DAYTON SUPPLY CO."

Dayton, O., Sept. 15, 1902.

Association News.

MORE UNFORTUNATE LITIGATION.

W. R. Young, a Kansas City master plumber, with a shop on East 15th street, has brought suit in the Circuit Court against the Master Plumbers' Association of Kansas City, The United States Water & Steam Supply Co., The Sieben Mfg. Co. and The Reeves Supply Co., in which the defendants are charged with being a trust operating in violation of the Missouri Trust Law. Mr. Young alleges that the combination between the manufacturers and jobbers and the Master Plumbers' Association has practically ruined his business, and he asks for damages of $30,000 and attorney's fees. In addition to bringing this suit for damages in the local court, it is stated that the Attorney General of the state has been furnished with the charges and asked to cause proceedings to be begun to prevent the alleged trust from continuing its business further in Kansas City.

Those who have had occasion to test the Missouri Anti-Trust Law know that it has been held by the Supreme Court to be valid and is considered by lawyers to be a very stringent statute. The law provides that where a combination, agreement or pool is entered into between persons, firms or corporations to limit trade or competition by refusing to buy from or sell articles or commodities to those outside of the organization and those so discriminated against are damaged in their business, damages to the amount of threefold of the injuries actually suffered may be obtained by the aggrieved persons. Under this particular section of the law Mr. Young hopes to win his suit.

According to Mr. Young's statement he is now unable to purchase from the local jobbers the necessary material for carrying on his business; he alleges that the jobbers have absolutely refused to accept cash for goods which he desired; that he will be able to prove by witnesses that at least one firm stated that the reason goods would not be sold to him was that he was not a member of the association; that the only way he has been able to secure goods to carry on his business has been through other persons; that it has frequently happened where he has been the lowest bidder on a job, master plumbers who are members of the association have prevented him from securing the contract by informing the owners of the property he could not get material to carry on the work; that he has been harassed to such an extent that he finds it exceeding difficult to carry on his business.

Nor is Kansas City the only section where the trade is accused of being in a trust or an agreement to prevent competition. The Indianapolis papers are giving large space to the charges that the associations are operating in defiance of the law. It is stated in the Indianapolis papers that supply houses are furnished with a list of master plumbers who are not members of the association and are requested not to sell goods to these firms. A definition of a master plumber is given as "A man who has a regular shop and who keeps one or more journeyman plumbers regularly at work." A Chicago paper last week came out with nearly a column anonuncing in bold terms the combination of master plumbers, jobbers and manufacturers and journeymen plumbers, so that master plumbers who were not members of the Master Plumbers' Association would not be able to purchase goods.

Of course to those who are actually familiar with the workings of the National Association of Master Plumbers and the various supply associations and the journeymen plumbers' union, these statements seem very wide of the mark, and the only reason DOMESTIC ENGINEERING is referring to them at this time is to deprecate the conditions which give rise to so much unpleasant notoriety.

Protection to the plumbing trade is as legitimate as any trade practice or custom can possibly be. It is the inalienable right of the master plumber to be a merchant and purchase his own supplies, and it is undeniably a good practice which restricts the sale of plumbing material to master plumbers only, and prevents the consumer from purchasing goods directly from the jobber or manufacturer. There are not two opinions as to the righteousness of this sort of trade protection, and on this platform all sections of the trade could unite. But we are sorry to say that the various branches of the trade are at sea upon any form of trade protection beyond this point and in some localities where organizations are strong enough to induce the manufacturers and jobbers to work with them, it is evident that charges such as are made in the public press have some foundation. We regret that these charges are made, and that the statements securing such wide publicity have a tendency to cast odium upon the

plumbing business. We are quite sure that the officers of the National Association of Master Plumbers are sincere in their efforts to elevate the standing of the trade in the opinion of the public, and that they do not countenance any action by their local associations which will have the reverse effect.

One unfortunate feature of this trade protection dispute is that neither side seems to be able to live up to its position. The supply associations have passed what are known as the "Chicago Trade Resolutions," and members of the association have not been unfailing in their adherence to them. On the other hand, the National Association of Master Plumbers have passed what are known as the "Cleveland Trade Resolutions" and these in turn are not lived up to by the National Association of Master Plumbers and its various allied associations and individuals. It seems to us as though some central point of contact should be secured where the supply associations and master plumbers' associations could stand in unison. And that this rallying point should be fair protection to the plumbing trade.

If we may be permitted to utter a word of warning, we would suggest that the continuation of a policy by which manufacturers and jobbers of plumbing supplies are unable to retain their trade and operate in unison with the National Association of Master Plumbers, will inevitably drive the manufacturer and jobber to seek his market among the consumers, and thus the great desideratum, protection to the legitimate trade, will be lost. The plumbing trade in England is at a very low ebb because there is no trade protection, and supplies are sold over the heads of master plumbers. There is evidence that in the United States this policy of selling goods to the consumer will come to be carried out unless a basis of operation is secured upon which manufacturers and jobbers can continue to do business. It may not be too late for DOMESTIC ENGINEERING to hope, even after repeated failures have been experienced, that the two branches of the trade will get together on a common platform and be able to secure protection to the legitimate plumbing trade. Repeated failures should only goad them on to greater efforts to secure success, and it is absolutely essential that this basis of action, when it shall be evolved, shall be such that concerns entering into agreements can carry them out without sacrificing their business position.

"MORE UNFORTUNATE LITIGATION."

The preceding article, which was published in our Weekly edition of September 13 has called forth among other letters the following:

"To the Editor of DOMESTIC ENGINEERING.

"Sir:—I have enjoyed reading your article entitled 'More Unfortunate Litigation' in the issue of September 13 and am pleased with the manner with which you have handled the matter.

"It seems to me that the fundamental right of a plumber to trade protection is generally conceded by fair-minded men, but it seems to me that the cause of the friction existing between plumbing trade and the manufacturing and jobbing trade is the element of coercion which never produces anything but friction, and if this element could be eliminated then the friction would cease. If this statement be true, how best can it be eliminated is the study for us, and in my opinion if each individual does his share the element of coercion would be a thing of the past.

"The statement of Lincoln that 'no man is good enough to govern another man without that other's consent' seems to me to cover the ground, making it applicable to business as it applies to everything we come in contact with. Today there is too much coercion in business, and I am opposed to it in every way, as I know it is productive of no good and much evil. Your paper and the other trade papers have an opportunity to do good, as it is purely a question of education and I believe the thinking men in the plumbing trade and jobbing trade would not endorse coercion if they saw its evils.

"It is difficult for a trade paper to assume a perfectly neutral position, as its advertisements are really the support of the paper, but the trade paper can call attention to the abuses that exist without fear or favor and leave it with those interested to remedy them. With best wishes,

"Yours very truly,

"R. E. CAREY."

New York City, Sept. 15, 1902.

SEVENTH ANNUAL CONVENTION WASHINGTON STATE ASSOCIATION OF MASTER PLUMBERS.

Seattle, Wash., Sept. 4.—The seventh annual convention of the Washington State Association of Master Plumbers, which was held here from August 25 to 29, opened on the morning of August 25 with a short session, and at 2:30 in the afternoon the members of the association, with their families, went on a pleasure excursion on Lake Washington. The party went to the lake via the Yesler Way line, and upon arrival at Leschi Park found the steamer L. T. Haas waiting to convey them on a tour of the lake. In the evening the delegates attended a reception and ball tendered in their honor by the master plumbers of Seattle. The entertainment committee for this the first day of the convention consisted of the following gentlemen: Howard Sweeney, J. E. Young, D. H. Lyman and Walter Westover.

On the following morning the association convened again and a business session was held, extending from 9 o'clock until noon. At noon a dainty luncheon was served at the hall by the wives of the members of the local Master Plumbers' Association. In the afternoon visiting delegates were taken to the races at the fair grounds, witnessing the race for the prize—a silver cup—offered by the master plumbers of Seattle. The entertainment committee of this, the second, day consisted of the following gentlemen: J. W. Manaway, P. Thomas, R. T. Ward and J. W. Creevey.

The morning session on Wednesday was devoted to the consideration of the reports of committees and of numerous legislative questions and the revision of the by-laws of the organization. Several resolutions were passed to the legislature for legislation in the interests of the trade. At the afternoon session officers were elected as follows: President, W. J. Creevey; vice-president, P. Joyce; secretary, D. H. Lyman; treasurer, Ben Olson. W. R. Coffee, W. Westover, E. J. Lambert and A. M. Goddard were chosen to represent the association at the national convention of plumbers at San Francisco next June.

In the evening the visiting delegates were tendered a very pleasant banquet by the members of the local association. This banquet was held at the Hotel Stevens Cafe and was one of the most pleasant features of the convention. The entertainment committee on this occasion consisted of the following gentlemen: H. Potter, H. Coughlin, A. E. Ayers and J. C. Kelly.

Having completed the business of the convention at the previous sessions, the fourth and last day was devoted to an excursion on the sound on a steamer specially chartered for the trip. The members of the association visited Bremerton and went on board the naval vessels now undergoing repairs there, after which they proceeded to Evergreen Park, where a clam bake and picnic were held, including athletic sports of various kinds and other forms of amusement. The entertainment committee on this, the last, day were: W. B. Mullin, H. M. Cameron, Theo. Turner, Joe Stuck and D. H. Lyman.

The Washington State Association of Master Plumbers was organized six years ago and now has a membership of eighty-three shops, there being eleven cities and towns of the state represented in the membership. The growth of the organization during the last year has been very gratifying, the increase in the membership amounting to nearly 40 per cent.

This the seventh annual convention was considered by those in attendance to have been the most successful and the most enjoyable of any ever held by the association.

The attendance of out-of-town members of the association was quite large, among those present being the following: Mr. and Mrs. J. J. Joyce, Ritzville; Jacob Mades, West Seattle; Chip Groom, Fairhaven; Mr. and Mrs. C. W. Stoddard, Mr. and Mrs. Haskell and John McLound, Whatcom; Mr. E. B. Lambert and Mrs. Lambert, Arnold Evans and E. S. Johnson, Spokane; Mr. and Mrs. W. B. Coffee, Mr. and Mrs. Benjamin Olson, Mr. and Mrs. A. M. Goddard, Mr. and Mrs. O. P. Larson, Mr. and Mrs. Ed. Butterfield, Mr. and Mrs. George Clark, Mr. and Mrs. E. J. Haninford, William Welch, Tacoma; T. H. Bellingham, Tacoma, and Robert Haddow, Tacoma.

THE ATLANTIC COAST MASTER PLUMBERS' ASSOCIATION.

On December 9, 1901, there was organized what has come to be known as the Association of Master Plumbers of the Atlantic Coast. The object of the association is stated to be: "Mutual co-operation in the market of the dealers from whom you purchase your supplies and for trade protection in every sense which the word implies."

Membership in the association is limited to local associations and individual members in good standing in the National Association of Master Plumbers at the time of the Atlantic City National Convention, but it is necessary to affiliate with the National Association before you can become a member of the Atlantic Coast Association.

James F. Traynor, Wilmington, Del., president of the association, has given a great amount of time to the compilation of data as to the source from which the master plumbers of the territory covered by the association and in the states they desire to add purchase their supplies. He finds that there are 150 dealers in plumbing supplies constantly soliciting trade in that territory. One hundred and one of these dealers are located in the territory and confine their sales almost exclusively to the states in the territory and they sell 93 per cent of all the material sold in the territory. Mr. Traynor says that the percentage of sales by states is as follows: New Jersey, 85; Pennsylvania, 88; Delaware, 96; Maryland, 97; District of Columbia, 95; Virginia, 94; North Carolina, 91; South Carolina, 90, and Georgia, 82. By which we understand Mr. Traynor to mean that the foregoing percentages of all the goods sold in the states mentioned are sold by dealers whose places of business are located in the territory of the Atlantic Coast Association. Mr. Traynor asks: "Does it not stand to reason that if you desire full trade protection you must confine your energies to the market of the dealers from whom you buy your supplies?" And then he states that if the trade in that section is well organized, the dealers will be only too glad to comply with their wishes, and reasons that it is to the interests of the master plumbers to join in the Atlantic Coast Association work which he says has the entire sanction of the National Executive Committee, the members of which have promised their undivided support in their efforts to establish trade protection "in its fullest sense."

The second annual meeting of the convention will be at Richmond, Va., Dec. 8-9, and memberships are now being received. The headquarters will be at Murphy's Hotel and delegates can have rooms reserved by addressing Morgan R. Mills, 28 N. 9th street, Richmond, Va.

THE THIRTEENTH ANNUAL CONVENTION OF THE UNITED ASSOCIATION OF JOURNEYMEN PLUMBERS.

Omaha, Neb., Aug. 25.—The thirteenth annual convention of the United Association of Journeymen Plumbers, which was held in this city from Monday till Saturday of last week, was called to order at 2 o'clock Monday afternoon in Labor Temple. Mayor Moores delivered the address of welcome on the part of the city, and President Dan Clifton on the part of the local union. The nationalization committee thereafter made its report. This committee had been in session in Chicago the preceding week. According to resolutions drawn up by this committee, no local union can go on a strike without the consent of the national association. Any lodge that does shall forfeit strike benefits. This is expected to minimize the number of strikes.

In a strike some time ago the association spent $30,000 and did not get a thing to show for their money, but, according to the new arrangement, every dollar will be utilized.

The second day of the convention was given over largely to the discussion relative to an amendment to the constitution, providing that each member pay 30 cents a week dues for a strike benefit fund. This question was left over until the Thursday session, when, along with other amendments to the constitution, it was passed. Wednesday was taken up with speeches by President Merrick, W. J. Spencer and L. W. Tilden in support of the constitutional amendments. After the two days' discussion the plumbers adopted the new constitution on Thursday. Assistant Secretary Thomas Burke, of Chicago, led the discussion in favor of revision. The chief features of the revision centralize the power with the executive officers and provide various benefit funds. The articles covering the benefits provide for strike benefits of $5 a week for eighteen weeks, sick benefits of $5 a week for thirteen weeks, and a minimum death benefit of $100. It provides for the assessment of 30 cents a week on the 20,000 members, the money to remain in charge of local lodges and be subject to check of the executive officers. The convention also, at this time, appropriated $10,000 to carry on the lockout fight at Dayton, Ohio. The money was made immediately available.

Thursday evening a sumptuous banquet was served at the Dellone Hotel, 250 covers being laid. It was in every way a success.

Most of the important business of the convention had been finished, and Friday was spent in completing the articles of the nationalization plan which had occupied so much of the convention. Routine business was also taken up. During the discussion Friday W. A. Campbell, of Chicago, financier of the National Cigar Makers' Union, was present by invitation, and argued in favor of the new constitution.

The day's session closed with nothing left to be done but the election of officers, which was taken up at the final session on Saturday morning. The salaries of the officers were readjusted, and the president, secretary-treasurer and grand organizer will now receive $1,500 a year.

The revised constitution and by-laws will go before the locals for a referendum vote October 7. The following officers were then elected for the ensuing year:

President, William M. Merrick, Beverly, Mass.

Secretary-treasurer, L. W. Tilden, Chicago.

Auxiliary secretary, William Burke, Chicago.

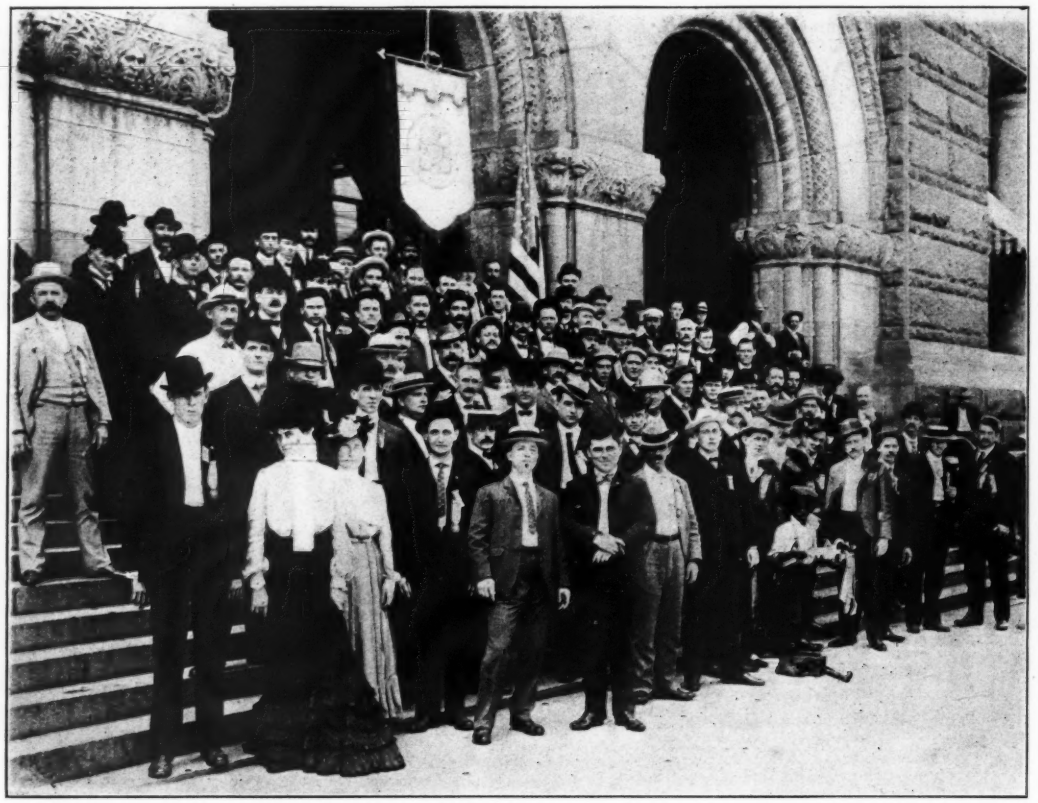
Grand organizer, William J. Spencer, Sioux City, Iowa.

Delegates to American Federation of Labor, John S. Kelly, Chicago; Thomas M. Dooley, Cincinnati, and Russell R. Hunt, Schnectady, N. Y.

Vice presidents, J. J. McKee, Pittsburg; Joseph Crotty, New York; J. O. Persons, Norfolk, Va.; Robert M. Simpson, Seattle; J. Priestly, Toronto; Percy Waters, St. Louis; Charles Kiefer, Bridgeport, Conn.; Robert Knightly, Washington, D. C.; J. J. McTighe, Los Angeles, and George Olsen, Chicago.

Birmingham, Ala., was chosen as the place of meeting next year, some time in August, the exact date to be fixed by the executive committee.

The convention was one of the most successful in the history of its organization, and the journeymen confidently expect that great results will come from their week's conference at Omaha.



United Association of Journeymen Plumbers at the 13th Annual Convention, Omaha, Neb. August 18-21.

MANAGERS WANTED.

One of the largest manufacturers of heaters in this country is desirous of securing the services of competent managers for their New York and Philadelphia offices. Here is a rare opportunity for the right men. All communications addressed to "Manager Heating," care DOMESTIC ENGINEERING, Chicago, will be forwarded to the company.

ON THE MARKET SOON.

The Federal Manufacturing Company, 129 Old Colony Building, Chicago, are experimenting with a new faucet which they expect to present to the public in the near future. Its simplicity and utility presage for it a proper recognition. Watch for a cut of it in the DOMESTIC ENGINEERING soon.

Geo. F. Uber & Co., Philadelphia, are plumbing a Germantown residence, using Cooper's Nautilus closets.—Adv.

CARRIES A COMPLETE LINE.

Thomas G. Knight's place of business at 359 Pearl street, Brooklyn, N. Y., is headquarters for plumbers, steam and gas fitters' supplies. He always carries in stock a complete line of the very best supplies for the plumbing and steam fitting in first-class jobs and invites all plumbers to correspond with him or call up 190 Main. It will help you in doing business with him to mention DOMESTIC ENGINEERING.

H. Kelly & Co., Minneapolis, Minn., are plumbing the residence of Mr. McDonald, using six of Cooper's closets.—Adv.

A CONVENIENT AND EXCELLENT PENCIL.

The Joseph Dixon Crucible Company, of Jersey City, N. J., have just put on the market a new flat pencil, known as Dixon's Palisade No. 1580. It is finished in a handsome yellow and is specially convenient, as its shape takes up little room in the pocket, and it can be used by magazine readers as a paper cutter and by all readers as a book mark. A sample of this handy and excellent pencil will be sent to those who write for it and mention DOMESTIC ENGINEERING.

W. T. Cantwell, Utica, N. Y., is remodeling the plumbing in a residence in that city, using Cooper's Nautilus closets.—Adv.

NATIONAL RADIATORS IN DEMAND.

The National Radiator Company has received through its Philadelphia office, a large order from Harry Miller of Wilmington, Del., for radiators to be used in the New Government Building being erected at League Island. This company has booked orders from Lewis T. Rodan of Bristol, Pa., for the radiation to be used in a large apartment house in Camden for which he has the heating contract and also for a new school house at Bristol, Pa.

Frank B. Boon, Philadelphia, is plumbing the residence of Mr. Geo. Buchanan, using Cooper's closets, lavatories, baths and other plumbing fixtures.—Adv.

ABOUT PENINSULAR MFG. CO.'S SPECIALTIES.

The Peninsular Manufacturing Company, of Ann Arbor, Mich., have just issued an exceedingly neat little folder of sixteen pages, with fine illustrations and descriptions of their Low Tank closets and seats. The folder is neatly bound in a heavy brown cover and in every way embodies the characteristics of their superior goods. You would do well to write for one, mentioning DOMESTIC ENGINEERING.

Jos. Brown & Co., Jamaica Plains, Mass., are installing two of Cooper's closets in a residence in that city.—Adv.

PHILLIPS HOT WATER BOILER.

T. L. Phillips, of Aurora, Ill., has just received his patent papers for the Phillips hot water boiler. This boiler is built on the correct plan. It has a double heating method, no heat being wasted. The hottest spot in any fire is in the center of the red coals, and in this heater the pipe goes down through the center of the red coals. The firepot itself is enclosed by boiler filled with water. Liberal terms will be given to dealers, and you are invited to write to Mr. Phillips, mentioning DOMESTIC ENGINEERING.

C. S. Thompson & Bro., Atlantic City, have some alteration work on hand in which they are using Cooper's Nautilus closet.—Adv.

BUSINESS IN FILTERS ACTIVE.

New York Continental Jewell Filtration Co., 15 Broad street, New York City, report an active business in filters for water works, manufacturing business, etc. They have just completed the erection of a filter plant for the new building of the New York Stock Exchange, New York City; also filter plants for the Beaver Valley Water Co., Beaver Falls, Pa., St. Andrews Academy, Poughkeepsie, N. Y., and have just received the contract for the new Y. M. C. A. building in West Twenty-third street, between Seventh and Eighth avenues, New York.

F. J. McGarry & Bro., Philadelphia, are plumbing the residence of Mr. Taylor, using Cooper's goods.—Adv.

DEMAND FOR CATALOGUES IN AMSTERDAM, HOLLAND.

Consul Frank D. Hill, of Amsterdam, writes that it would be advisable for exporters of iron, steel, coal, and electrical supplies to send catalogues to that consulate, as he intends to devote a room exclusively to circulars of American firms, folders of American railways, steamship lines, cable companies, etc. He has received many visits of late from people interested in the import trade, and they desire data in regard to United States industries.

Rossman & Bracken Co., New York City, have a contract on hand in which they are using five of Cooper's closets.—Adv.

MAKE GOOD FEED WATER HEATERS.

The American standard feed-water heater, manufactured by the Whitlock Coil Pipe Company, of Elmwood, Conn., has, according to its makers, a good many points in its favor, some of which are that it contains no joints inside of shell to cause trouble by leaking and is made of pure seamless copper coils, brazed solidly to special gun metal fittings and supported with improved clamp stays. It will heat feed-water instantaneously and all coils are tested to 600 pounds pressure. They make these feed-water heaters in twenty-six sizes, with a capacity of from 5 to 3,000 horsepower, and they will be glad to send complete information to interested parties who write and mention DOMESTIC ENGINEERING.

Jas. Morris, Philadelphia, is plumbing the residence of Mr. Schneider, using Cooper's Nautilus closets, baths, showers, etc.—Adv.

MAKE PLUMBERS' BRASS GOODS.

The Union Brass and Metal Mfg. Co., of St. Paul, Minn., are well known manufacturers of plumbers' brass work. Everything in this line can be secured from them—ball cocks, boiler couplings, compression bibbs, and basin cocks, closet clamps, Fuller bibbs and balls, spun metal stop cocks, tank valves, water backs, etc., etc.; in fact, everything needed in this line is made by the Union Brass and Metal Mfg. Co. The standard of the goods is such as to merit your correspondence if you are desirous of purchasing anything in this line. Kindly mention DOMESTIC ENGINEERING when you write and it will help you.

GAS FIXTURES FOR ATLANTIC CITY.

The Camden Gas Fixture Works, northeast corner of Front and Federal streets, Camden, N. J., are furnishing the gas fixtures for the Atlantic City Childrens' Sea Side Hotel, four stories high and containing 400 rooms.

They will also furnish the gas fixtures for a new hotel owned by Geo. W. Jackson with about 100 rooms, and for ten residences, cottages, etc.; in different parts of Atlantic City. Theodore Leas, the well-known real estate man, has recently taken the management of the Camden Gas Fixture Works, which are turning out an excellent line of goods which are constantly gaining favor with the trade.

NEW CATALOGUE OF PLUMBING SPECIALTIES.

The Fairbanks Company, of 360-366 Broadway and 14 Liberty street, Albany, N. Y., have just issued a very neat catalogue of plumbing goods, 36 pages, size 9½x12 inches, printed on high grade enameled paper and copiously illustrated. Some of the articles to which much space in this catalogue is devoted are the Beverwyck and the Rensselaer bathtubs, the Nassau, Hamilton, Gansevoort, Bleecker and Fulton closets, porcelain enameled iron lavatories, bathroom and lavatory furnishings and Niagara radiators.

This will be sent promptly to interested parties who write for it and mention DOMESTIC ENGINEERING.

H. F. Rice, Dorchester, Mass., is placing Cooper's closets in a residence in his city.—Adv.

THEIR NEW CATALOGUE OUT.

The Bignall & Keeler Manufacturing company, Edwardsville, Ill., have just mailed to the trade a handsome new catalogue, which is to take the place of their new general catalogue until that becomes ready for distribution. It is nicely printed and bound, and contains information and illustrations of all of their standard machines for hand and belt power, with the exception of the Peerless Special improved, which has the same capacity as the Peerless, Jr. They are also prepared to offer excellent designs for motor-driven machines with either constant or variable speed motors. They will be glad to answer any queries if you will write and mention DOMESTIC ENGINEERING.

Geo. W. Walther & Co., Baltimore, Md., are installing some of Cooper's fixtures in some work they have on hand.—Adv.

MONARCH GAS HEATERS.

The attention of our readers is called to the subject of gas heaters, which many plumbers have taken hold of as helping out the dull months of the fall trade and being quite in line with their work. In this connection the Monarch Stove & Mfg. Co., at Mansfield, Ohio, have been making a line of these goods under the popular name of "Monarch," and we are advised from a number of our constituents that these goods have been found very desirable stock.

A new catalogue has just come from the press, showing the "Monarch" line in a very handsome manner, which embraces a large variety of styles and patterns, apparently filling every possible want, from a stove that is described as being equal to a hard coal burner, down to a little portable cylinder stove, that lists at the very low price of $2.50.

The "Monarch" gas heaters have been on the market for more than five years, and have built up a popularity among the trade that has made them a very desirable line. The plumbing trade has been taking hold of them very largely, and reports received are to the effect that the line works in very satisfactorily with the other work of the average plumbing establishment. The fact that gas is being more and more used for fuel and heating purposes makes it important that the plumbers throughout the country look into the matter of gas heaters very carefully, and we would suggest that a copy of the new Monarch Stove & Mfg. Co.'s catalogue be placed in the hands of the trade, which, no doubt, the company will be glad to do upon receiving an inquiry to this effect, mentioning DOMESTIC ENGINEERING.

FOWLER & WOLFE'S CATALOGUE OUT.

The catalogue of the Fowler & Wolfe Manufacturing Co., 668-70 Bourse building, Philadelphia, Pa., manufacturers of ornamental wall radiators, has just been received. The catalogue is the fifth edition and is very much enlarged and as neatly arranged, as their radiators are excellent. This company has fully equipped with all modern improvements and appliance a new factory at Norristown, Pa., for the manufacture of their wall radiators, and as all come under their own supervision, they guarantee perfect finish in every respect. The catalogue is in every respect an excellent messenger for this firm's goods and is well worth writing for if you need anything in this line. It will be helpful for you as well as us if you mention DOMESTIC ENGINEERING when you write.

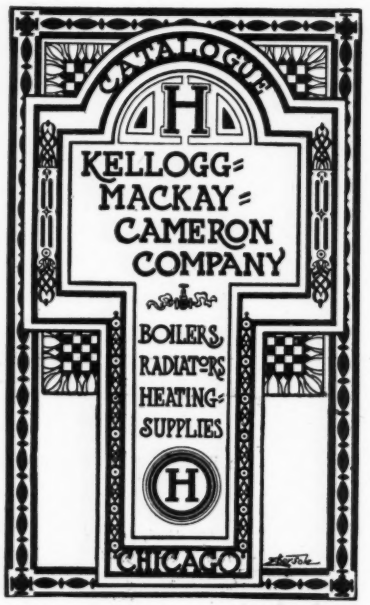
The Arnold-Evans Co., Spokane, Wash., are installing six of Cooper's Nautilus closets in a business block in their city.—Adv.

THE KELLOGG-MACKAY-CAMERON CATALOGUE.

The accompanying cut is a reduced copy of the design of the cover of the new catalogue issued by the Kellogg-Mackay-Cameron Company, Chicago. It is a noteworthy acquisition to the library of commercial literature.

In any line of business it should be the constant aim of the organization promoting it to add to its system and so improve and elaborate it in every detail that it reaches a stage at which it may be called the perfect machine. There never was an engine built the smooth and perfect running of which was not dependent upon the perfection of every detail in its construction. An imperfection in the smallest belt, cog, or link may simply render the most powerful engine ever built useless. So it is in the manufacture of such goods as are dealt in by this company. And to avoid all imperfections the only safe ground is constant vigilance at every point in their manufacture.

Again it is the aim of this company to so thoroughly steep itself in the heating and



ventilating business that it may become not only headquarters for everything needed "on the job," but also to make itself a model of progressiveness and good management.

Our attention to details, nursed by the years of experience and the old principle of the "survival of the fittest," have enabled us to make a selection of a complete steam and hot water heating apparatus from boiler to air valves and the *very best* selection of every article from the standpoint of excellence of material, workmanship and operation. The selection we have made we present to the public in the form of our new catalogue H.

In the steam or hot water heating problem we are confident that this catalogue is unique in being a complete collection of everything which the steamfitter could possibly need in installing a heating system. Cast-iron boilers, with vertical or horizontal sections, all sizes and many stiles, adaptable to all fuels; steel tubular boilers; or small boilers and hot water heaters for domestic or larger supply; boiler tools and trimmings; pipe and fittings of every material and design; valves; plates; radiators of all kinds, capacities, prices and ornamentation; air valves of many kinds of latest pumps, or steam taps, pipe machines, tools, etc., etc., etc.; in fact the steamfitter's wants improvements; regulators; expansion tanks, are as carefully attended to as a sick man's in a hospital. The *best choice* of everything has been the guiding principle of this collection and all these goods—many of them manufactured under our personal supervision (a guarantee alone of their excellence) the inspection of the trade through our new catalogue "H"—a handsome condensed catalogue of 315 pages, standard size—with no superfluous matter, no high sounding descriptions, but full to the brim with excellent cuts of most every article; lists and sizes, not only convenient, but absolutely indispensable to the wide awake heating contractor and engineer who has, or expects to have a trade to look after. To those actively engaged in the steam or hot water heating trade we will be pleased to send this catalogue, trusting a perusal may convince you of the excellence of our appliances and that we have put before you and within easy reach the most complete variety of this class of goods which real business enterprise can produce.

KELLOGG-MACKAY-CAMERON CO.
Lake and Franklin streets,
Chicago, Ill.

Saml. J. Wilson, Philadelphia, is installing Cooper's closets and baths in an operation he has on hand.—Adv.

IMPROVED PERFECTED DUPLEX NO. 6.

The question of automatic air valves on radiators would seem to the inexperienced of little consequence, when in reality it is one of the most important devices on a perfect heating plant, for by it the system is

relieved from the accumulation of air and permits the current of dry steam to circulate.

Perhaps no one realizes the necessity of a perfect working automatic air valve any more than does the steam fitter, who has had any amount of trouble with that class of cheap air valves. They now reason that a cheap valve is the most expensive at any stage of the game, for architects and owners frequently hold back final payment until a job is heated at 70 degrees, as per specifications, no cold radiators or coils or leaking valves acceptable.

Here is a valve for your kind consideration. It is known as the Perfected Duplex improved locked shield No. 6; notice this valve has a double opening with a single connection; by that is meant that the air tube extends from the interior of the radiator into the valve above the top of the float which takes the air from the radiator, conducting it to the top of the valve, forcing the air out of the valve by equalizing the pressure and causing the water to flow back into the radiator instead of out on the floors and carpets, and thus keeping the radiator free from the air as it accumulates.

The locked shield feature of this valve is very unique, for it requires a special key to adjust the valve. It has no caps to lose, no screws are exposed to be meddled with, and with the key in the hands of the proper authority the valve cannot be tampered with.

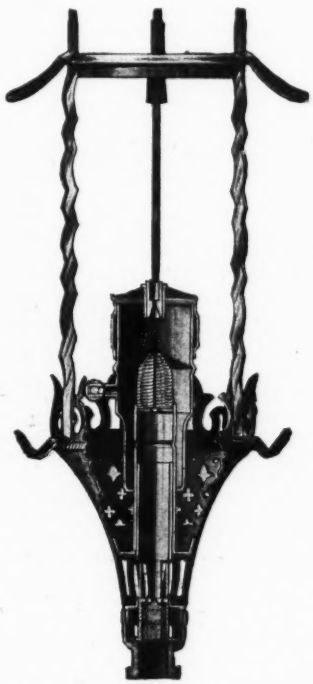
The Monash-Younker Co., Chicago and New York, we understand, guarantee this valve in the hands of the user for a term of five years, giving that guarantee in writing if desired. The guarantee consists, as we understand, that they replace an imperfect valve for a perfect one within that length of time.

This company also manufactures other specialties and would be pleased to send their catalogue to the trade, mentioning this journal when you write.

Patrick Cregan, Chicago, Ill., is plumbing the residence of Mr. Wells, using Cooper's Nautilus closets.—Adv.

THE LINDSAY VIBRATION BURNER.

Lindsay & Co., in their catalogue just issued, illustrate and describe the new "Lindsay" Vibration Burner. We are able to show a very fine sectional view of this burner herewith, which should be of considerable interest to all users of and dealers in incandescent gas supplies.



The demand for a reliable burner of this character is well known, and there have been numerous attempts to produce a satisfactory vibration burner before this, but without success, in view of the action of heat on necessary springs that may be used in their construction.

In the "Lindsay" vibration burner the location of the spring within the central tube removes it from the heat of the flame, and it is also further protected by an non-heat conducting cap. In consequence this spring never loses its flexibility through the action of heat.

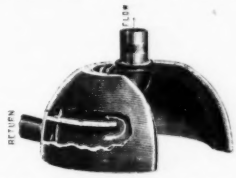
The center guide rod acts not only as a guide to retain this spring in position but also, by reason of its flexibility, constitutes a spring to cushion lateral shocks received by the lamp. This burner is likewise equipped, as will be seen in illustration, with an improved pivot adjustment for regulating the flow of gas. By the use of this adjustment the trouble of blackened mantles is entirely obviated and a proper proportion of air and gas secured.

Illustrations and further description of these burners can be had from Lindsay & Co., manufacturers of lighting specialties, 170 Lake street, Chicago, if you write and mention DOMESTIC ENGINEERING.

Drew & Co., Philadelphia, are installing Cooper's closets in a residence in that city.—Adv.

CHAMPION HOT WATER COMBINATION HEATERS.

We are glad of an opportunity of calling our readers' attention to the Champion hot water combination heaters, manufactured



by Frank D. Stolz, of 115 Lake street, Chicago, Ill. The first cut herewith shown illustrates the base section when used without ring sections. The second cut illustrates the ring section. These sections fit any furnace and are made in five sizes diameter,

and they have a radiation capacity of from 100 to 700 feet. They will heat those out of the way cold rooms or an addition to the building. They will increase the capacity of any furnace and they are cheaper than coils.

For complete information address the manufacturer, who will answer every inquiry promptly. Kindly mention DOMESTIC ENGINEERING when writing him.

The Chris Irving Plumbing & Heating Co., Denver, Colo., are placing twelve of Cooper's closets in a business block in that city.—Adv.

A BOOK ABOUT CALIFORNIA.

It is Easy and Inexpensive to Go There Now That the Railroads Have Reduced Their Ticket Fares.

During the winter months, while those in most parts of the country are suffering from extreme cold and disagreeable weather, California, the land of sunshine, is radiant with fruits and flowers and everything that is green and beautiful.

Formerly a trip to California was an expensive luxury, but now that the railroads have very greatly reduced the price of tickets, and particularly since we have introduced the "Personally Conducted Excursion" idea, you can go to California in a comfortable through car by the choicest route and for a very moderate sum.

Is it worth while to fight through the winter at home when you can so easily go where the perfect climate will keep you strong and vigorous? The saving in doctor's bills likely will pay for a California trip. Send six cents in postage for our handsome little book about California. It is intensely interesting and is beautifully illustrated. Address P. S. Eustis, Passenger Traffic Manager, Chicago, Burlington & Quincy Ry. Co., Chicago.

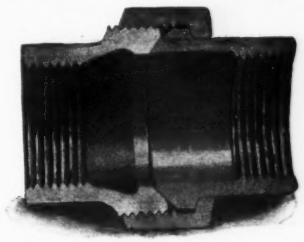
White & Blakeslee, Westfield, Mass., are plumbing a fine barber shop in Springfield, Mass., using Cooper's goods throughout.—Adv.

THE KEWANEE WATER SUPPLY SYSTEM.

The Kewanee Pneumatic Water Supply Co., Kewanee, Ill., are manufacturers of the Kewanee automatic pneumatic water supply tanks and valves. They install air pressure waterworks in residences, farms, stores, office buildings, shops, factories, villages, and cities. They are glad to send their pamphlet to plumbers or any other parties who may be interested in this line of water supplies. The book tells master plumbers how plumbing can be put in buildings where water mains are not accessible, thus increasing business, and will give additional information regarding their system. A line mentioning DOMESTIC ENGINEERING will bring you a prompt reply.

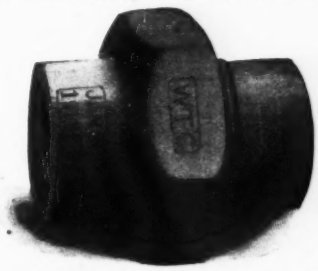
THE KEWANEE UNION.

The manufacturer of Kewanee union claims economy in its use, not only because of its durability, but the actual cost is no greater than that of the ordinary malleable union when taking into consideration cost of gasket and the additional time necessary to



adjust the ordinary malleable union. It is efficient for the following reasons:

Though the Kewanee union is a combination of two metals, the brass part, the more sensitive to varying temperatures, is con-



fined by a ring of malleable iron screwed on at normal temperature until a tight seal is made, which naturally remains secure by increased heat.

The screw joint is non-corrosive, making it possible to disconnect at will without injury to the ring, an important feature that will be appreciated after futile attempts in making an all iron malleable union tight, after it has been once used, for the reason that energy necessary to disconnect crushes the ring, making it practically useless for further service.

The manufacturers, the Western Tube Company, of Kewanee, Ill., will be glad to send interested parties complete information, if they write for it and mention DOMESTIC ENGINEERING.

J. J. Hanighen, Omaha, Nebr., are plumbing the Hall County Court House, Grand Island, Nebr., using fifteen of Cooper's Nautilus closets, and other of Cooper's fixtures.—Adv.

Automatic Water Purifying and Softening Apparatus System "Breda."

There is a growing conviction on the part of engineers that the best way to keep scale out of the boilers is not to let it get in; in other words, to precipitate and remove scale-forming matter from the water before it enters the boilers.

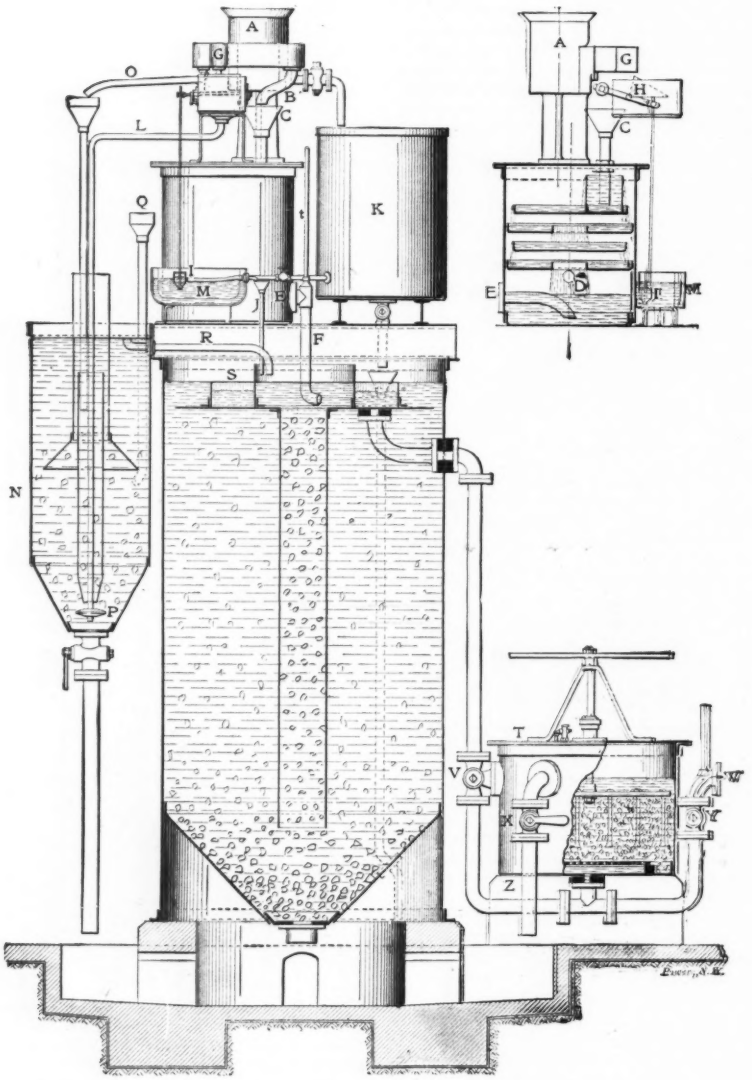
Impure feed water is the worst enemy of boilers. All well, river or city water contains more or less impurities, namely, lime and magnesia combined with carbonic acid, chlorine, sulphuric acid, etc., which form a great amount of mud and a very hard scale in the boilers. The amount of danger, delays, repairs and great coal consumption are well known to every engineer or owner of boilers.

According to the statistics from 1877 to 1900, 15 per cent of all boiler explosions are attributed to scale and accumulation of sediment.

When boilers are fed with purified water, bulging and bursting of the fire plates and burning out of water tubes are avoided and no corrosion can take place, so that the life of the boiler is lengthened two or threefold.

From experiments by R. Wilson, a well-known authority, the coal consumption is increased 15 per cent with 1-16 of an inch thickness of scale and from 40 to 50 per cent with ¼ of an inch thickness of scale. From these statistics every owner of boilers can figure how much coal he wastes yearly by using impure feed water.

The water purifying apparatus illustrated is manufactured by the Rational Water Purifying Co., New York, and it is an invention of H. Breda, of Berlin, an experienced specialist in the field of water purification, who, during his years of experiments, has installed many complete water purifying plants to the fullest satisfaction of his patrons. His experienced chief engineer, Mr. Besser, has been engaged by the local firm and has taken full charge of the mechanical part of the company.



The water purifying apparatus in which the scale-forming substances and acids are separated through the agency of soda and saturated lime water contains to the greatest extent all the qualifications required of a first-class apparatus.

The apparatus has special advantages because it acts independently of the flow of feed water. The flow of chemicals is automatically controlled by the amount of feed water, so that there is a supply of perfectly purified water whether there is a large or small amount passing through.

A very important innovation is contained in the lime water saturator. In contrast with other constructions, the quick lime in supply is not only stirred up by a stream of water, but also with air, whereby the lime is more thoroughly mixed up, which creates uniformly saturated lime water.

The water enters the apparatus at the highest point and is separated into two streams by a changeable distributor—A—one flowing through—B—to the heater, the other to the lime water saturator—N.

The first stream is heated with live or exhaust steam, and then enters the mixing chamber through the pipe—F—there creating a very rapid circulation whereby it is thoroughly mixed with the chemicals. The other stream passes the second distributor—G—which separates a small quantity for the operation of a tilting basin—H. The rest flows then directly through—O—to the lime water saturator—N. As soon as the tilting basin—H—is filled with the water, it tips and fills the small cup—I—in the soda chamber—M—with soda solution. Instantly a balance raises the tilting basin—H—and also the cup—I—which empties a measured quantity of soda solution into the mixing chamber through a rubber tube. The tilting basin empties automatically about five or six times per minute exactly in proportion to the supply of necessary feed water. The small compartment—M—is controlled by a ball cock and supply pipe, and is always filled uniformly from the large compartment—K—which is filled daily with the proper amount of soda solution. The water from the tilting basin—H—which discharges periodically, flows through pipe—L—to bottom of the lime saturator—N—and each time draws a quantity of air down with it whereby the quick lime at the bottom is thoroughly stirred up. This lime mixture then slowly raises, clarifies before reaching the top, and flows through—R—in the form of saturated lime water to the mixing compartment, where the precipitation of the scale and corrosion forming substances takes place at once. During the violent circulation of the water in the mixing chamber the precipitations form into flakes and the water flows from here into the settling chamber; then the precipitations sink to the bottom, where they can be drawn off through a valve. A light and easy cleaning filter, which is attached to the apparatus, finally separates the last traces of impurities from the water so that it flows through—W—perfectly soft and clear as a crystal into the pure water receiver.

Water going through this process leaves neither scale, mud, oil, nor foam, nor will it corrode the boiler plates.

The handling of the apparatus is very simple and requires but fifteen minutes daily, handled by any employe, to keep it in working order.

This water purifying apparatus is manufactured by the Rational Water Purifying Co., P. O. Box 157, or Bennett building, No. 99 Nassau street, New York, who will be glad to furnish interested parties with complete information upon application, mentioning Domestic Engineering.

F. A. Wendall Plumbing & Heating Co., Watertown, Mass., have a contract for an office building in Boston, using Cooper's closets, lavatories, and other plumbing fixtures.—Adv.

Sunlight Lava Acetylene Burner Catalogue.

The Sunlight Lava Manufacturing Company, of 31 Market square, Chattanooga, Tenn., who recently succeeded to the business, good will and rights of the Sunlight Acetylene Gas Burner Company, have just issued a very neat illustrated and descriptive catalogue of their acetylene burners. Their burners are accurately rated as to consumption and of uniform steady light-giving flame, without carbonization and with perfect combustion of the gas. Another good feature found in them is that they are scientifically designed, having the mixture

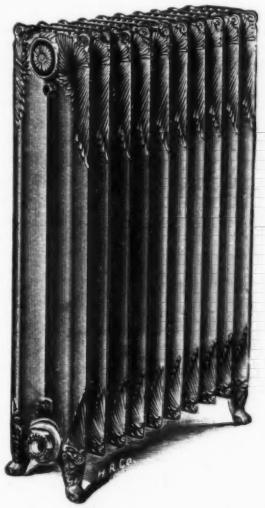
of gas and air carefully calculated and physically having reference to the least chance for lodgment of dust and foreign particles.

Interested parties will be favored promptly with a copy of this booklet upon application, mentioning DOMESTIC ENGINEERING.

Frank Richter & Bro., New York City, are installing Cooper's closets in an operation they have on hand.—Adv.

THE BREMEN RADIATOR.

The accompanying cut represents the "Bremen," a radiator manufactured by the Holland Radiator Company, with offices at 38 Dearborn street, Chicago, and 731 15th street, Denver, Col.. They manufacture radiators in all heights for steam and hot



water, and have a complete line of two column, three columns and window radiators, Their radiators are finely constructed, as well as handsomely designed, and they will be glad to furnish any information or descriptive matter if you will write to them and mention DOMESTIC ENGINEERING.

THE LOUIS LIPP COMPANY'S NEW CLOSET COMBINATIONS.

The Louis Lipp company, with factory and main office at 1113-1123 Gest street, Cincinnati, Ohio, has just issued a very interesting circular advertising a few of their new low-down closet combinations, such as their Champion and Columbian low-tank washdown syphon combination and their universal and Glenwood combinations. The universal combination is a low tank double-flush syphon jet, and the Glenwood is a low tank syphon jet combination. These closets have bowl to rough in at 12 or 17 inches, and they are complete in quarter-sawed oak, either light antique, golden oak or cherry.

The Louis Lipp Company say that they have never sold their product simply on price, although they are such large manufacturers that they can make them of high grade fixtures about as cheap as a smaller concern can make cheap and inferior goods, and they also think it would pay jobbers and plumbers well to remember that they use all quarter-sawed oak lumber, and that each outfit, leaving their factory, is made up of handsomely finished stock. There is a certain "something" about the Louis Lipp Company's goods that, according to the makers' claims, makes them "stick out," so to speak.

For the sake of our readers in New England it may not be amiss to state that they have a branch at 120 High street, Boston, Mass.

Interested parties can on application obtain complete information about these excellent closets and the other high grade articles made by this company, of which we perhaps ought to call special attention to their Empire iron enameled bath tubs, of which they make from 155 to 160 per day. When writing them kindly address them at Cincinnati, Ohio, and do not forget to mention DOMESTIC ENGINEEERING.

Clarke & Son, Indianapolis, Ind., are placing two of Cooper's closets in the residence of Mr. Dietrich in that city.—Adv.

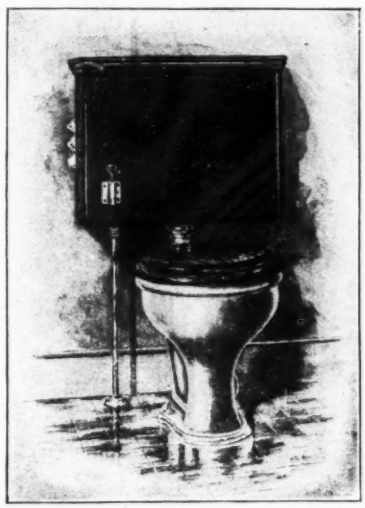
KROESCHELL BROS. ISSUE CATALOGUE.

The handsome new catalogue issued by Kroeschell Bros.' Ice Machine Co., of 29-39 Erie street, Chicago, has just been received. It contains eighty pages of fine enameled paper, upon which are printed many handsome cuts of the machines which they manufacture. The print is green with a dark cover upon the catalogue, and is in every way a nicely arranged affair. They will be glad to mail you one if you will write and mention DOMESTIC ENGINEERING.

Joseph Hubely, Philadelphia, is plumbing the residence of Dr. Pettit, using Cooper's closets, lavatories, baths, etc., and other plumbing fixtures.—Adv.

THE HY-LO COMBINATION.

We take pleasure in reproducing a cut of the Hy-Lo, which is manufactured by the Detroit Lead Pipe and Sheet Lead Works, 57-61 Second street. The Hy-Lo is one of the latest closet combinations upon the market and has for its characteristic features, high in quality and low in price. It is in



every way a successful closet. This company is also manufacturers of lead pipe, sheet, bar and pig lead, solder, etc. They are also extensive jobbers in plumbers, steam and gas fitters' supplies, tools and metals. Any information relative to the closet combination or any other of their goods will be gladly furnished if you write and mention DOMESTIC ENGINEERING.

A HANDSOME CATALOGUE.

"The Efficient" is the expressive name of the gas burners, lamps, mantels and glassware manufactured by the Irby & Gilliland Co., Memphis, Tenn. They have just issued a handsome new catalogue descriptive of "The Efficient lighting goods." This line of burning devices is designed to meet every requirement and condition in lighting. They are scientifically constructed and produce a great amount of light for a given consumption of gas. They are adapted for either artificial or natural gas. These burners are constructed under their own patents and are fully protected. They will be glad to furnish anyone interested with further information concerning "The Efficient" if you will write to them, mentioning DOMESTIC ENGINEERING.

HEADQUARTERS FOR PLUMBING SUPPLIES.

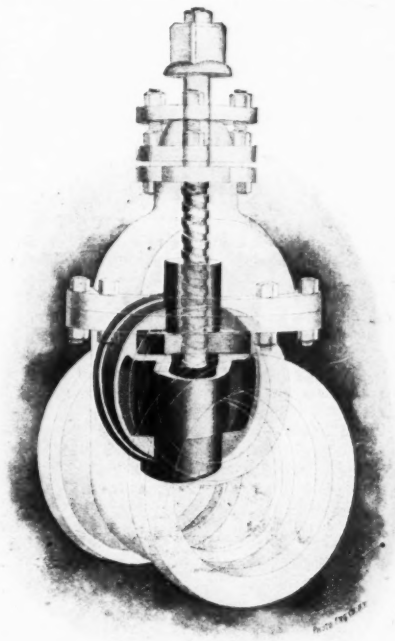
The National Brass and Metal Co., with office and salesroom at the corner of Third avenue and Third street, South, Minneapolis, Minn., are headquarters for all kinds of plumbing supplies and sanitary specialties. They always carry on hand a large line of bath tubs, closets, brass goods, iron pipe and fittings, stone pipe and fittings, babbitt and solder. They are among the leading manufacturers in the west and solicit correspondence with you if you desire the best in these lines. It will help you as well as us if you mention DOMESTIC ENGINEERING when you write.

Newton & Gray, Philadelphia, are plumbing the residence of Mr. Chas. Segar, using Cooper's closets, baths, lavatories, laundry and pantry and other plumbing fixtures.—Adv.

THE VINCENT GATE VALVES.

The Vincent gate valves are of the double parallel gate style and have a straightway passage full size of pipe. From the standpoint of durability and economy this, the manufacturers claim, is acknowledged to be a peerless gate valve. They are made in sizes from ½-inch upward for any kind of liquid materials, as well as gases, and the material used is well adapted to resist the impurities of the liquids to be handled.

The Vincent adjustable wedge double gate valve, herewith illustrated, has iron body with cover and wheel and is bronze mounted with screwed or flanged ends. Its adjustable



wedge performs the important duty of seating the gates. Spindles are pure bronze mixture, such as specified by the government and leading engineers throughout the country. Stem nuts and set rings are all prepared from the same kind of metal. Gates in sizes up to three inches are all bronze. In the larger sizes they are made of cast iron with bronze ring dovetailed in. The material is of the highest grade and workmanship unequaled, the makers claim.

Sweet & Doyle, of Cohoes, N. Y., and of 238 Franklin street, Boston, Mass., will send full particulars on application, mentioning DOMESTIC ENGINEERING.

W. C. Kelly, Easton, Pa., is placing some of Cooper's goods in a residence in Reigilsville, Pa.—Adv.

ELECTRIC WELD RANGE BOILER.

The cut herewith presented represents an electric weld range boiler, manufactured by the John Wood Manufacturing Co., Conshahocken, Pa. These boilers are sent out from the factory unconditionally guaranteed, which fact alone shows the confidence

which the manufacturer has in the boiler. They combine quality and durability, with satisfactory price, and no one can be dissatisfied if they consult with them when contemplating buying such an article. If you write them it will be an advantage to you to mention DOMESTIC ENGINEERING.

Curtis Mann, Denver, Colo., has some fine work on hand in which he is using Cooper's closets, solid porcelain lavatories, showers, etc.—Adv.

THE LUNKENHEIMER CO.'S NEW CATALOGUE.

The current edition for August, 1902, of the Lunkenheimer Co.'s new catalogue has just been received by the editorial department of DOMESTIC ENGINEERING. The catalogue is a revised edition of their 1898 catalogue and calls attention to a large number of their new specialties. Since issuing their 1898 catalogue they have greatly increased their facilities and expect by the end of this year to occupy their new factory building, which will be unsurpassed by any similar structure of this kind. They are in better condition now than ever before to supply their products promptly and furnish goods which are unequaled as regards material and workmanship. The catalogue contains 208 pages of matter, profusely illustrated, with complete price lists. It is well bound and is in every way in accord with the growing business of this firm. The catalogue states that the firm will not be responsible for any mistakes made by using old lists, so you are required to destroy all the old catalogues and get their new one, which is complete and attractive. Write to the Lunkenheimer Co., manufacturers of superior brass and iron valves, injectors, whistles, lubricators, oil and grease cups and steam specialties, at Cincinnati, O., and have one mailed to you. Do not forget to mention DOMESTIC ENGINEERING when you write.

John T. Cushman, West Newton, Mass., has some fine work on hand in which he is using Cooper's Nautilus closets, lavatories, baths, etc.—Adv.

PEERLESS RUBBER MFG. CO. ISSUE CATALOGUE.

Catalogue No. 50, issued by the Peerless Rubber Mfg. Co., 16 Warren street, New York, is a 40-page booklet, handsomely illustrating their entire line of engineers' specialties. It is pocket size and gives full description, with price list, of the specialties patented and manufactured exclusively by this house. A few of their special goods are the Peerless spiral piston and valve rod packing, Rainbow packing, Hercules combination metallic stop valve packing and Honest John hydraulic rainbow core packing. Discounts will be quoted supply houses writing for the catalogue when DOMESTIC ENGINEERING is mentioned.

Gunster & Forsythe, Scranton, Pa., are remodeling the plumbing in a residence in that city, using Cooper's Nautilus closets.—Adv.

THE LUTA ACETYLENE BURNER.

The accompanying cut illustrates Bray's new burner "Luta" for acetylene gas, for which the Wm. M. Crane Company of 1131-1133 Broadway, New York City, are sole

agents for the United States. This burner is, according to their claims, superior to any acetylene burner ever produced, and they will be glad to send their Blue Book with complete particulars about this and some of their other excellent lighting fixtures.

Robt. Major, Philadelphia, is plumbing a Locust street residence, using Cooper's Nautilus closets, solid porcelain lavatories, baths, etc.—Adv.

THE ELECTROLITE ACETYLENE HOUSE LAMP.

Since the discovery of acetylene there has been great activity on the part of inventors to produce a thoroughly practical house lamp, by means of which this beautiful and perfect light could be made generally available at small cost and under portable conditions.

The Electrolite, manufactured by Edward Miller & Company, of Meriden, Conn., is perhaps the best result of all efforts made in this direction. The makers claim that it is a perfect acetylene house lamp, having all the commercial and technical qualities necessary to permit of the use of acetylene gas by everyone and everywhere with absolue safety. This lamp received the only award for a practical automatic acetylene table lamp at the Pan-American Exposition last year, and it is included in the list of permitted acetylene devices issued by the consulting engineer of the National Board of Fire Underwriters, and it is hence permitted for use by the insurance companies.

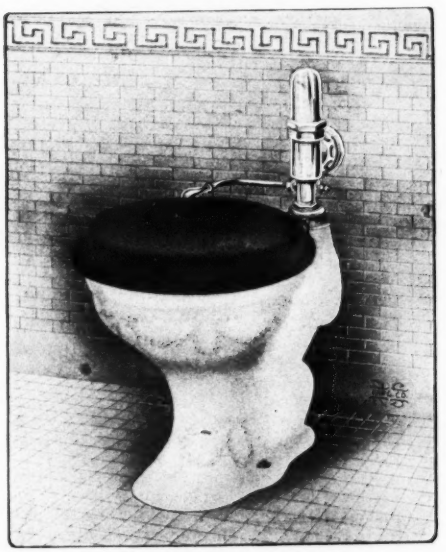
The manufacturers assert that this lamp will not develop any objectionable features under continued service and they have not yet received any complaints from any of their customers, but all from who they have heard, have been well pleased with it. Interested parties will be favored with a neat illustrated catalogue, if they write for it and mention DOMESTIC ENGINEERING.

Davenport Steam Heating Co., Davenport, Iowa, are remodeling the plumbing in a residence in that city, using Cooper's Nautilus closet.—Adv.

THE COMO FLUSH VALVE.

The Como flush valve, herewith illustrated, is manufactured by the Rundle-Spence Mfg. Co., of Milwaukee, Wis., and it is a new, neat and noiseless device for flushing water closets. Through its use a standing column of water to the closet is maintained at all times, which is released by pulling valve handle forward. A thorough flush is given without holding the handle, which goes slowly back to its original position as soon as released. Thus while valve is descending to its seat closet is being flushed. The duration of flush may be increased or decreased as desired by use of the regulating screw, and as screw is operated from the outside, the necessity of shutting off water pressure and taking valve apart is obviated. The noise caused by the water flushing the bowl is reduced to a minimum, making it a very desirable fixture.

A novel feature which the use of this valve permits in a building where there are two or more closets is the unifying of



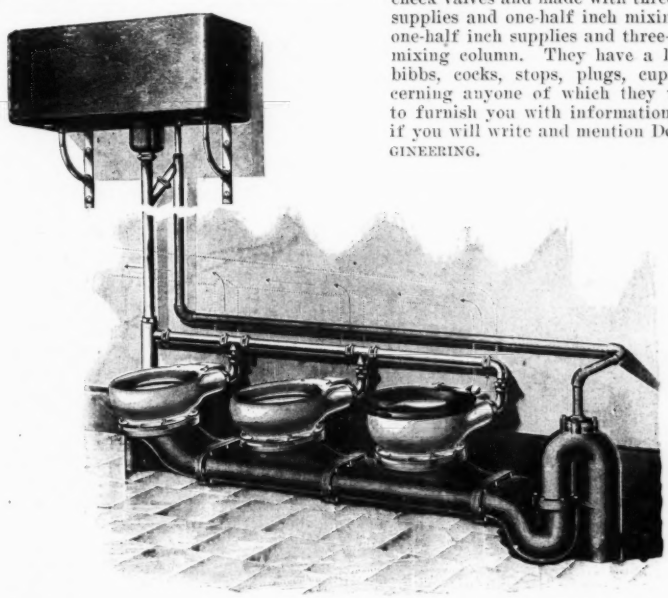
tanks. All closets may be operated from one tank providing its bottom is at least six feet higher than the highest closet. While the Como flush valve can be used on pressure direct from the city main, it will not give the universal satisfaction to be had from the use of a tank centrally located on the roof, top floor or in attic. A direct supply from city main to valve is so largely affected by the drawing of water at various fixtures throughout the building that the supply at water closet may be greatly lessened if not entirely gone, while such other fixtures are being used.

The manufacturers of this desirable fixture are just now making a special offer to those who will exhibit it in their place of business for a period of not less than sixty days. Why not write and ask for it, mentioning DOMESTIC ENGINEERING?

Jas. A. Loughney, Philadelphia, is installing Cooper's baths and other fixtures in a W. Philadelphia residence of Mr. Wright.—Adv.

The Sanitas Automatic Water Closet Range.

Smith & Anthony Company, of Boston, Mass., manufacturers of Sanitas basins and sinks, Sanitas closets and traps, and brass goods for plumbers' use, are also manufacturers of the Sanitas automatic water closet range, herewith illustrated. A careful examination of this illustration will, the manufacturers claim, convince everybody that this apparatus is a little better in every particular than any other on the market.



The manufacturers will be glad to send interested parties complete information with prices on application, mentioning Domestic Engineering.

Booklet on Heating.

We have received from the Herendeen Manufacturing Company, of Geneva, N. Y., an advance copy of a little booklet of 24 pages, entitled "Warmth—In Ways Diverse." This is a handsome publication, dealing with the various methods of warming houses, from the open fire and stove to the modern steam and hot water systems, profusely illustrated, and giving a large amount of useful information. The cover is handsomely illustrated in colors representing the spirit of warmth.

It is mailed free on application by the Herendeen Manufacturing Company, Geneva, N. Y., who also manufacture the celebrated Furman steam and hot water boilers. Kindly mention Domestic Engineering when writing for this excellent booklet.

H. Schleuning, Allegheny, Pa., is installing Cooper's goods in an operation he has on hand.—Adv.

Where to Hunt and Fish.

The Northern Pacific Railway have just published a very timely vacation book under the title "Where to Hunt and Fish." While the text gives information of value to sportsmen, more particularly, the illustrations, principally of live game, appeal to everybody. Specially to be noted are illustrations after drawings from Ernest Thompson-Seton, the well-known lecturer and author.

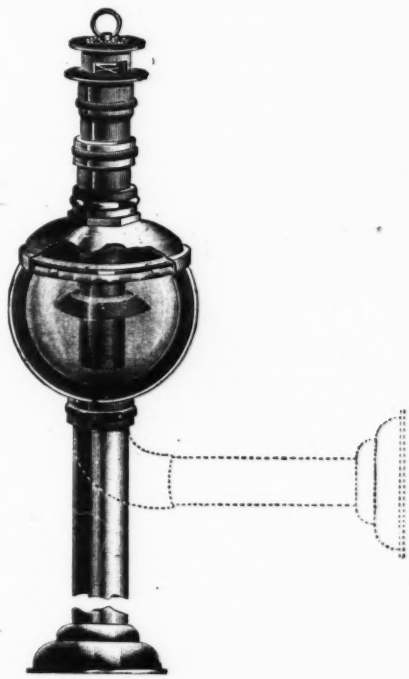
Mr. Chas. S. Fee, general passenger and ticket agent of the Northern Pacific Ry., St. Paul, Minn., will send a copy of this excellent book on receipt of six cents in stamps. Kindly mention Domestic Engineering, when writing for it.

Make High Grade Bath Room Supplies.

Hoffmann & Billings Manufacturing Company, Milwaukee, Wis., are manufacturers of all kinds of bath room supplies and fixtures. One of their leading sellers is their high grade nickel plated shower bath with shampo attachment. This shower is made entirely of iron pipe sizes, brass tube, fitted with check valves and made with three-eighth inch supplies and one-half inch mixing column or one-half inch supplies and three-quarter inch mixing column. They have a large line of bibbs, cocks, stops, plugs, cups, etc., concerning anyone of which they will be glad to furnish you with information and prices, if you will write and mention Domestic Engineering.

The Radcliffe Improved Anti-Syphon Trap.

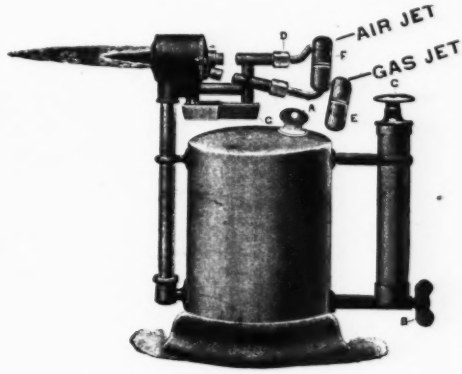
The Radcliffe improved anti-syphon trap herewith illustrated is manufactured by the Ohio Brass and Iron Mfg. Co., of Cleveland,



Ohio, who claim that it fully deserves its name, having proved itself absolutely anti-syhponic; that is to say, that no air and consequently no sewer gas can return through the trap. By the use of this trap water cannot, it is claimed, be syphoned out below the level of the flange, and it is impossible for the air to come back through the pipes. The Sanitary Specialty Mfg. Co., of 55-57 North Clinton street, Chicago, Ill., who are sales agents for this trap, claim that several tests have proved that it will withstand the syphonic action and that there always will be water left in the trap to form a perfect seal against sewer gas. They will be glad to send interested parties complete information on application, mentioning Domestic Engineering.

The Turner Double Jet Torch.

The Turner Brass Works, Chicago, are manufacturers of the Turner double jet torch herewith illustrated. These torches are especially interesting to mechanics on account of their great heat producing qualities and their ability to save time wherever used. The cause of this lies in the improved construction of the burner. The burner is controlled by two separate valves, one for the air jet and the other for the gas jet. These two jets enter the combustion chamber separately and are there united into one intensely hot, pointed flame which can readily be changed to a broad flame of equal intensity. The Turner double jet torch will fuse nickel easily, requiring about 3000 degrees F., while the ordinary single jet torch on the market will not flow brass successfully which only requires 1873 degrees of heat. This torch is unequaled for brazing, tempering, annealing, soldering, burning off paint or similar work. Mechanics who have used the Turner double jet torches say that they can easily save half the time on every job.



Kindly mention Domestic Engineering when addressing the manufacturers for complete information about this excellent torch or any of their other high-grade products.

Geo. Kraus & Co., Lebanon, Pa., is plumbing a large building in that city, using Cooper's closets and other goods.—Adv.

Reineke, Wilson Co.'s Trade Topics.

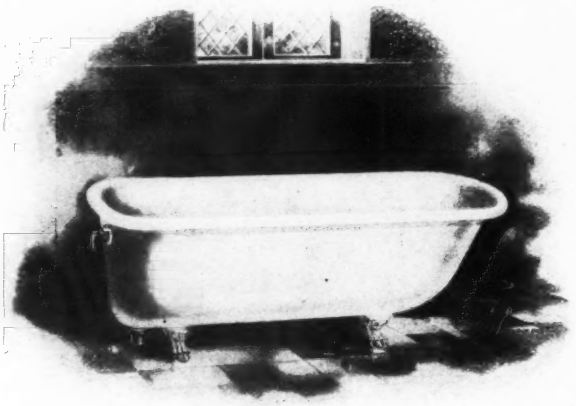
"Trade Topics" is the name of a publication which the Reineke, Wilson Company 13-19 Wood street, Pittsburg, Pa., issue from time to time in the interest of their large business in pumps, chandeliers, gas stoves and appliances, supplies for gas, water, steam and electric light. The latest issue of this publication has just reached us, and it contains, besides some interesting reading, a goodly number of excellent half-tone engravings, showing interior views of their several departments, as well as of several of the eight different buildings in Pittsburg which they occupy, and of their new factory at Johnstown, Pa., which is to be devoted exclusively to the manufacture of gas ranges, gas heating stoves, gas fireplace heaters, gas furnaces, gas burners and all supplies and appliances for natural and artificial fuel gas.

Interested parties can obtain a copy of "Trade Topics" by writing for it and mentioning Domestic Engineering.

Drew & Co., Philadelphia, are plumbing a residence on Girard avenue, using Cooper's baths, lavatories, etc.—Adv.

A Handsome Enameled Bath Tub.

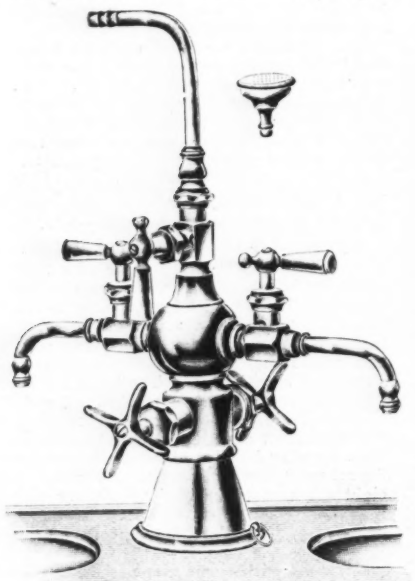
We take pleasure in illustrating this handsome bath tub, manufactured by the Humphryes Mfg. Co., Mansfield, Ohio. It is a happy illustration of the quality and appearance of their line of goods. They also manufacture enameled flat and roll-rim



kitchen sinks, enameled corner and flat back lavatories, lavatory traps, brackets and supply pipes, bath room supplies, solder, nipples and a large variety of plumbing brass goods. Their enameled ware is fully guaranteed. You are invited to correspond with them if you are contemplating a purchase in this line. Kindly mention this paper when you write and it will doubly assure you of a prompt and satisfactory reply.

The S. & K. Shampoo and Basin Cock.

We are glad to show herewith a cut of the S. & K. combined fuller and compression shampoo and basin cock, which is made for the double basin. They are also making them for single basins. The merits of the article are well shown in the cut. Simplicity



and neatness are its strong qualities. The faucet is easily regulated and repaired. The Street & Kent Manufacturing Company of 43-45 Fulton street, Chicago, Ill., are the manufacturers and any queries sent to them will be gladly acknowledged if you mention Domestic Engineering when you write.

Novel and Pleasing Advertising.

A very pleasing advertisement is one just received from the Utica Heater Co., of Utica, N. Y. It is a portfolio of views, illustrating their excellent line of steam and hot water boilers. There are seven different illustrations of their "Keystone" steam and hot water boiler, the "Imperial" steam and hot water boiler, and the "Auburn" round boiler. These illustrations are printed upon heavy enameled paper, clearly defined and distinct. Their boilers are conservatively rated, the capacities being carefully based upon actual results attained, and they are always willing to furnish new parts for any found defective in manufacture. It will greatly please you if you can secure a set of these pictures, and we suggest that you write them early, mentioning Domestic Engineering, and, no doubt, they will favor you with a set.

S. H. Barrett, Auburn, N. Y., is remodeling the plumbing in a residence in that city, using Cooper's Nautilus closets.—Adv.

The J. L. Mott Iron Works' New Catalogue.

One of the most attractive catalogues recently received is that just issued by the J. L. Mott Iron Works, 84-90 Beekman street, New York City, manufacturers of radiators and steam boilers. The catalogue is a copyright book of 100 pages of fine enamel paper, and it is handsomely illustrated throughout. The line of boilers and radiators illustrated in the catalogue are the result of long experience and careful consideration of all the problems connected with the warming of a modern residence or business building, together with a thorough knowledge of the difficulties to be overcome by the steam or water fitter in constructing a heating apparatus suitable to modern requirements. The best way to learn about their large line of boilers and radiators is to write to them, mentioning Domestic Engineering, and have them mail a copy of this new catalogue.

Moline Heating & Construction Co., Moline, Ill., are remodeling the plumbing in a residence in that city using Cooper's Nautilus closets.—Adv.

Novel and Effective Advertising Folder.

The Gobeille Pattern Company of Cleveland, Ohio, have just issued an exceedingly neat and artistic folder, containing the information that their's is the largest pattern works in the world and that they make artistic stove patterns from the designs and under the personal watchful superintendency of Jos. Leon Gobeille. The following statement made in this folder will no doubt be read with interest by many of our readers:

"We spend only $3,000 a year for advertising. Never employed a traveling representative. Never made anything for sale as duplicates. We are in no sense merchants and know nothing of business. But we make more patterns than all the other public stove pattern shops in the U. S. combined."

"We are advertised by our loving friends." Here are ten selected, almost at random, of the present time:

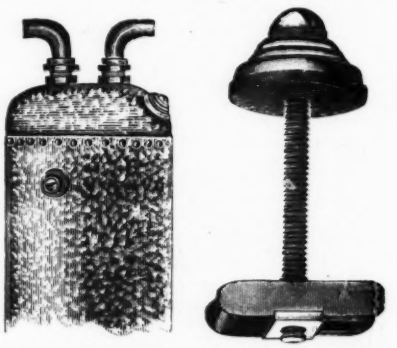
"W. E. Buck, president of Wm. Buck Stove Co., Brantford, Ont.; Lazard Kahn, of F. & L. Kahn & Bros., Hamilton, Ohio; Fred E. Lee of Beckwith Estate, Dowagiac, Mich.; W. N. Moore president of Joliet Stove Works, Joliet, Ill.; W. H. Pfahler of Abram Cox Stove Co., Philadelphia; Charles L. P. Prizer, president of Prizer-Painter Co., Reading, Pa.; Jos. F. Quay manager of the Summit Foundry Co., Geneva, N. Y.; Isaac F. Roe president of the Rossmore Co., New York City; Henry Terstegge of Terstegge, Gohmann & Co., Louisville, Ky.; Arthur Willis Walker president of Walker & Pratt Manufacturing Company, Boston.

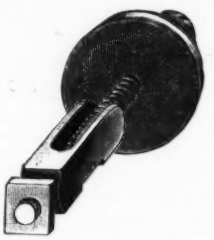
"Glance over the list. Is there a single weakling? Only one argument has weight with that crowd. They get better value for their money here than elsewhere. Ask any of them.

"The Gobeille Pattern Company.
"Cleveland, Ohio."

Phillips' Hold-Tight Boiler Repair.

For stopping rust holes when they occur in galvanized range boilers or any kind of a boiler for that matter, it would be difficult to find anything more handy and convenient than the Hold-Tight boiler repairs, manufactured by the Phillips Manufacturing Company, 219 East 34th street, New York City, and they are so strong, durable





and neat that plugs and solder cannot be compared with them.

The first cut herewith illustrated shows the repair after it is put on, making a neat and thorough job. The second cut shows the repair before using and the third cut illustrates the position of bridge or holder on entering hole in boiler.

The manufacturers will be glad to send illustrated and descriptive circulars of these and their other excellent specialties on application. Kindly mention Domestic Engineering when writing them.

Pickett & Goodwin, Beverly, Mass., have some alteration work on hand in which they are using Cooper's goods.—Adv.

THEY HAVE A "JUNIOR."

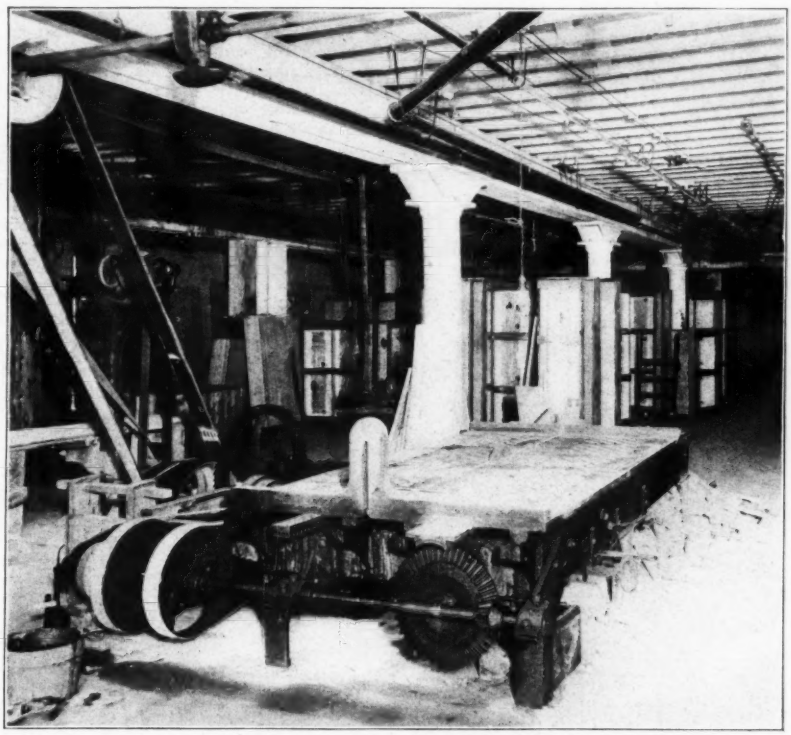
It is with unstinted pleasure that we call the attention of the readers of these columns to a new style automatic air valve which the Chicago Air and Water Valve Company, 31-33 S. Canal street, Chicago, are now introducing in the market. The valve, or rather "OUR JUNIOR," as it is called, is diminutive in appearance, and, aside from its perfect action, is such a sturdy and handsome little valve that it will prove an ornament to any radiator. With the possible exception of the absence of the lock-shield feature, it is exactly like their regular automatic air valve. Possessing all of the strong fundamental principles of the "Chicago system," and selling at such a reasonable price, it is bound to appeal to the trade and will undoubtedly assume an important position in the air-valve world. This valve, we are informed, is intended to satisfy the demand for an inexpensive and perfect acting durable valve, and they report that already there is a noticeable appreciation of this recent effort to please the trade in the shape of unprecedented calls for the same. A half-tone of the valve may be seen in their "ad." in the display pages of the monthly DOMESTIC ENGINEERING, and is well worth looking up, or better still, sending for their illustrated booklet, "About VALVES."

The Chicago Air & Water Valve Company deserve to be congratulated for their wide-awake and up-to-date methods of manufacturing air valves. They certainly show a keen appreciation of what the trade is in need of. Kindly mention this journal when writing them for further information.

F. Desormoux & Co., Springfield, Ohio, are installing Cooper's Nautilus closets in a residence in that city.—Adv.

A BRANCH FACTORY OF THE ALBERENE STONE CO.

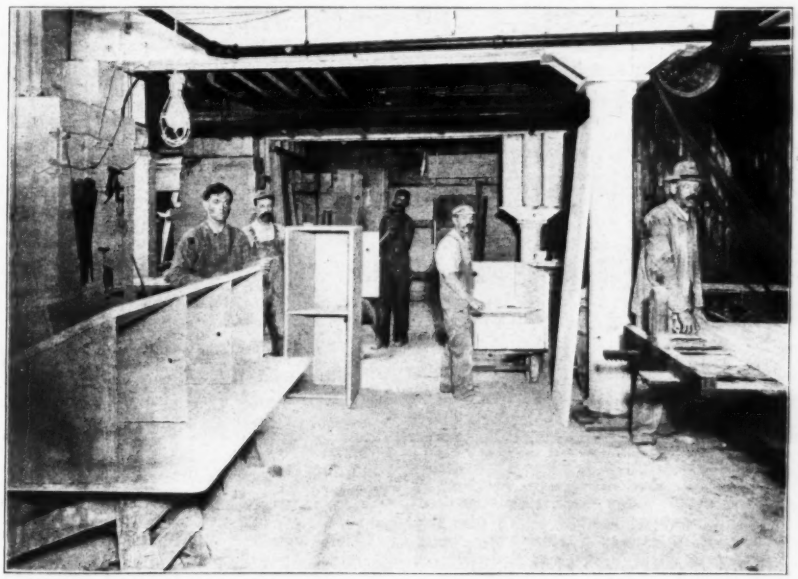
The illustrations produced here represent a portion of the factory and warehouse of the well-known Alberene Stone Co.'s Chicago branch, located at 54 to 60 North Clinton street, manufacturers of sanitary laundry tubs, kitchen sinks, urinal stalls, acid tanks, etc.



Interior View of Alberene Stone Co's Factory.

They have but recently removed to the above location, as they found their old quarters too small for their increasing business. Alberene is not an artificial stone, as many suppose, but is taken from their quarries at Alberene, Va. They employ at that place over 1,000 men. The stone is being used largely in the construction of urinal stalls on account of its non-absorptive qualities, which makes it free from all odors. They are also furnishing it in large quantities for laboratory table tops, sinks, and work benches, also for electrical purposes; it being preferred to any stone on the market.

Their catalogue and sample of stone can be had by addressing them at the above address, mentioning DOMESTIC ENGINEERING.



Interior View of Alberene Stone Co's Factory.

D. F. Durkin, Jr., Philadelphia, is plumbing the residence of Mr. Thos. Allen, using Cooper's closets and baths.—Adv.

FRINK'S REFLECTORS ARE A1.

"Good stock needs good lighting" is a truth realized this season as never before by the leading merchants throughout the country, as evidenced by their orders for reflectors to the well-known house of I. P. Frink, 551 Pearl street, New York. Among the many contracts for Frink's special patent window reflector and show case lighting, in hand or recently filled, we are advised of the following: Gimbel Bros., Philadelphia; also their Milwaukee store; Siegel-Cooper Co., New York City; Bloomingdale Bros., New York City; the handsome new buildings of Saks & Co., and R. H. Macy & Co., New York City, two stores which, because of their location, have attracted general attention; Washington Arcade, Detroit; Kennedy Furniture Co., Butte, Mont.; Derby Desk Co., Boston; L. Hammill & Co., Mobile, Ala., who are conceded to have one of the finest store buildings in the south; J. N. Mockett, Toledo, Ohio; Hannifin Dry Goods Co., Milwaukee, and "The Leader," Minneapolis, Minn. It might be mentioned that, in addition to their special line of reflectors for window and case lighting, this concern manufactures a full line of cluster reflectors, mirror shades, etc. The former are well adapted to the lighting of store interiors, being preferred by many to the enclosed arc. The Wadleigh High School, New York City, about completed, has some 800 "Frink" clusters, which are the standard type of the New York Board of Education. The additional fixtures in this building, consisting of ceiling coranas, with bent glass domes, and arch reflectors, were all furnished by this firm. Their catalogue fully illustrates and describes their fixtures, and is intended to reach every dealer. A copy will be sent you on request. Kindly mention DOMESTIC ENGINEERING when you write for it.

THE N. R. CLOSET SEAT ATTACHMENT.

The N. R. closet seat attachment herewith illustrated is one of the latest inventions of Nathan Rubenstein, 552 Grand street, New York city. A glance at this by the eye of the practical master plumber or experienced architect at once detects its practicability and sanitary improvements. And the up-to-date modern plumber who is ever ready for the use of the latest improvements in the work he has to do will appreciate these goods. The N. R. (Pat.) Seat Attachment is a combination of clamp, arm and hinge, which clamps the bowl to

trap and at the same time fastens seat to bowl, thus making it possible to use the short and oval hopper closet, for open plumbing, in place of the washout closet, which is more expensive and which easily gets out of order.

This attachment does away with all wood and carpenter work, eliminates the drip tray and makes possible a neat and quick job. It is made of brass and silver plated, or of iron and galvanized, and of the best finish. All orders from the jobbers can be filled promptly. The very strongest indorsements are given these goods by the following, which speaks for itself:

Department of Buildings of the city of New York, May 29, 1902. Hon. Perez M. Stewart, Superintendent of Buildings:

Sir:—In reference to the N. R. seat attachment referred to me for examination and report, I have the honor to report that after thorough examination of the same I find that said seat attachment meets with all the requirements of the Bureau of Buildings, and recommend that it receive the approval of said Bureau of Buildings, for use in connection with water closets in the Borough of Manhattan. Respectfully submitted,

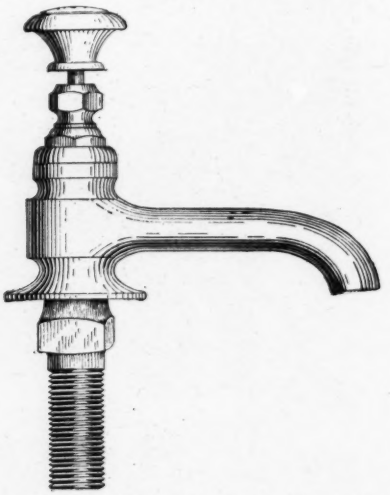
P. G. ANDREWS,
Chief Inspector of Plumbing and Ventilation.

Approved. PEGEZ M. STEWART.
Superintendent of Buildings, Borough of Manhattan.

Kindly mention DOMESTIC ENGINEERING when writing for full particulars.

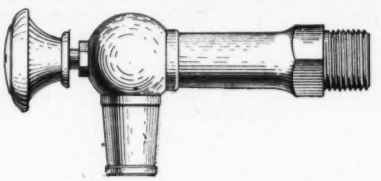
THE FIELD SELF-CLOSING BASIN COCK AND SINK FAUCET.

Plumbers wishing to help their customers to save on their water bills and obviate unnecessary expenses will no doubt be very interested in the Field patent perfection self-closing basin cock and sink faucet herewith illustrated. They are a new invention. They cannot be left open by servants or tenants and your water run to waste. They are right in every way and no other faucets can compare with them, the manufacturers claim. They have a patent chamber made so that the water must go through this chamber which acts as a water filter. No small fish, water eels or bugs can get through their patent chamber, they say. But these unwelcome visitors can and do get through the strainers at the reservoirs and get into the house water pipes, and if the water does not get filtered in some way,



people are liable to find them in the drinking water and not notice them when drinking water at night.

Some of the desirable points found in these goods as claimed by the makers are, that they will not water hammer, no springs are used, no oil is needed, as they are water lubricating, they have no stuffing boxes to get out of order and no stem packing. The only packing used is the three-eighths seat packing, which is very small and of the best of stock. This sets in a recess to avoid the cut of the water and will not get out of order. Their faucets are absolutely automatic and will work in battery form for both hot and cold water, i. e., on a line of



faucets. They will open when the water is shut off and allow the water to drip from the pipes and thus prevent freezing in winter. When water is turned on at meter every faucet will close at once, allowing no waste. They cannot be left open when pressure is on.

These excellent basin cocks and sink faucets are made with metal and china tops marked "hot" and "cold," and they are manufactured by the Field Automatic Valve and Faucet Company, 162 Dorrance street, Providence, R. I., who will be glad to send illustrated pamphlet, explaining the good points of these fixtures, to interested parties who write for it, mentioning DOMESTIC ENGINEERING.

E. C. Doane, Marblehead, Mass., are plumbing the residence of Mr. Elvert Wheeler, using Cooper's Nautilus closets.—Adv.

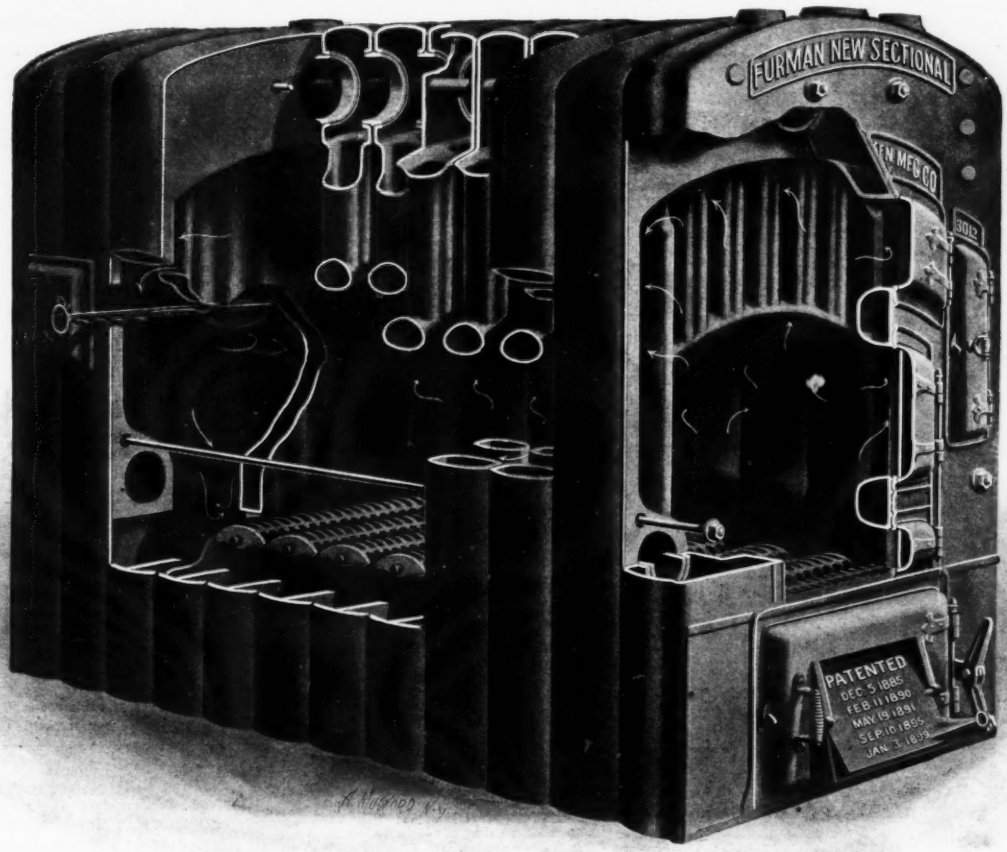
New Furman Boiler Catalogue.

We have just received from The Herendeen Manufacturing Company of Geneva, N. Y., makers of the well-known Furman steam and hot water boilers, a copy of their new catalogue. This is a book of thirty-four pages, handsomely printed on enameled paper, with cover in three colors, and describing and illustrating in the most profuse manner, with very high class cuts, the various boilers manufactured by the Herendeen company.

The first fifteen pages are devoted to a description and illustrations of the Furman new sectional boiler. This celebrated boiler is made in a great variety of styles, so that one may select a boiler especially adapted for burning soft coal or hard coal, or coke or natural gas or wood, as the case may be. It is made in four widths of grates, namely, 12-inch, 20-inch, 30-inch and 40-inch, and over fifty sizes, with capacities ranging from 175 square feet of steam to 5,700 square feet of steam, and 275 square feet of water to 9,400 square feet of water radiation.

One of the most interesting features of the Furman new sectional boilers is the fact that it is also manufactured as a central feed magazine burner, and, so far as we know, is the only boiler of this class which is made in this country. The various sections are put together with taper slip nipples, which are manufactured on a special automatic nipple machine designed and patented by The Herendeen Manufacturing Company. The tapered holes in the sections are bored on a special massive six-spindle boring machine designed expressly for this purpose, so that absolute accuracy is guaranteed in the assembling of the sections and the making of positively tight slip nipple joints.

The next part of the catalogue treats of the well known Furman water tube portable boilers, which have been manufactured by this company nearly a quarter of a century. These are made both as surface burners and magazine burners and for hard and soft coal, and are triple jacketed. These boilers are made in sizes ranging from 175 square feet of steam to 975 square feet of steam when used as magazine burners, and from 275 square feet of water radiation to 1,500 square feet of water radiation. As surface burners they range in size from 200 square feet of steam to 1,050 square feet, and from 325 square feet of water radiation to 1,725 square feet of water radiation.



The next section of the catalogue treats of the well known Furman brick-set boilers, which are made in sizes ranging from 325 square feet of steam to 5,000 square feet of steam, and in water from 525 square feet to 7,600 square feet. Illustration of a battery of three of the largest size No. 12 Furman brick-set boilers is shown on the back page of the catalogue, having a capacity of 15,000 square feet of radiation.

The last part of the catalogue describes and illustrates the Furman Junior boilers, which are made for both steam and water, in sizes ranging from 135 square feet to 275 square feet of steam radiation and from 175 square feet to 450 square feet of water radiation. It will be noted that the larger sizes formerly made in the Furman Junior styles have been abandoned, as the Furman new sectional boiler in the 12-inch series, which ranges in capacity from 175 square feet to 400 square feet of steam radiation, and from 275 square feet to 650 square feet of water radiation, is designed to take the place of the larger sizes of the Furman Junior boilers.

Finally, the catalogue contains telegraph and cable codes, tables of dimensions, and price lists, etc.

This catalogue should be in the hands of every progressive steamfitter and is mailed free on application, mentioning Domestic Engineering.

G. M. Wirth, Denver, Colo., is installing Cooper's closets in a residence in that city.—Adv.

A Handsome New Catalogue.

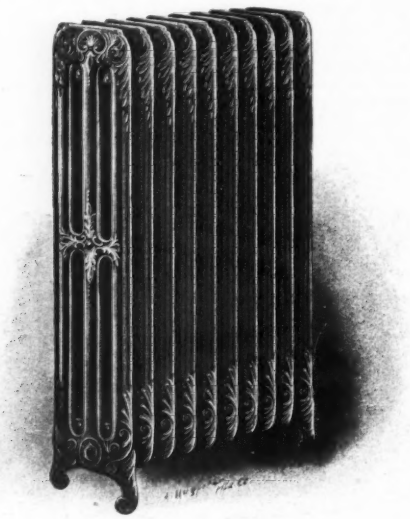
Domestic Engineering takes great pleasure in acknowledging the receipt of Catalogue "H," of Crane Hawley Company, Cincinnati, Ohio. It is a large book, 12 x 9½ inches, and contains about 275 pages of fine enamel paper, upon which are printed a great number of clear cuts, illustrating their large line of excellent plumbing goods. All the various essentials of the modern bath-room are illustrated with numerous cuts, and price lists given. Any kind of baths, suits, lavatories, closets and tubs are given, as well as the brass goods which are used in connection.

The catalogue is bound in a handsome cover, printed in white. We congratulate this firm upon such an excellent catalogue, and suggest that the trade write early and ask for one, mentioning Domestic Engineering when writing.

Stewart & Hayden, Burlington, Iowa., are installing three of Cooper's Nautilus closets in an operation they have on hand.—Adv.

THE CORINTH RADIATOR.

The accompanying cut of the Corinth radiator, manufactured by the Uniontown Acme Radiator Company, of Uniontown, Pa., is one of the hot water radiators which is a favorite with everyone who knows



it. They also handle the famous Model cast iron boilers, Kewanee, Haxtun Steel boiler and fire box boiler. Their goods are all of the best and you can make no mistake when you consult with them if you are contemplating a purchase along this line. Kindly mention this paper when writing and it will help you.

NATIONAL SEAMLESS WROUGHT STEEL SINKS

The National seamless wrought steel sinks herewith illustrated are drawn from a single sheet of heavy steel, are indestructible, odorless, lasting, and have perfect drainage. The waste outlet bowl is stamped from solid sheet, not seamed—any coupling can easily be attached. These sinks are plain, painted, galvanized, blue and blue enameled, blue outside and white enameled inside, patent genuine granite en-

ameled. These sinks are made by the National Enameling and Stamping Company, of Milwaukee, Wis., and 78-80 Beekman street, New York City, who have branch offices at the following places: 66-72 North Canal street, Chicago, Ill.; St. Louis, Mo.; Baltimore, Md., and 8-9 Stonecutter street, E. C., London, England. Address branch office nearest your location for complete information. Kindly mention DOMESTIC ENGINEERING when doing so.

"The greatest of faults is to be conscious of none." In making the "Winchester" steam or water heater, the manufacturers realize it has one drawback—it won't make heat without fuel. But it will make more heat on a hod of coal than some heaters will on a ton. Smith & Thayer Company, Boston, Mass.

TRADE WANTS.

WATER PIPE FOR SALE. FOUR AND SIX inch cast iron water pipes and fittings for sale. Specially adapted for use in small towns. Full particulars given. Address Box 913, New York City. 8-30 & m.

FOR RENT—EXCELLENT LOCATION FOR good plumber, with small capital, to start a sure paying business in northwest part of Chicago. No competition in neighborhood. Rent very reasonable. Address "J. H." care Domestic Engineering, 58-64 N. Jefferson St., Chicago. t f.

TRAVELING MEN, ATTENTION—WE HAVE some taking specialties in the heating line which we desire traveling men to present as "side lines" to the trade. We shall be glad to correspond with those who can furnish satisfactory references. Address, 1882, care Domestic Engineering, 64 N. Jefferson St., Chicago. t.f.

PLUMBERS AND STEAM FITTERS MAKE best agents for specialties in sanitary and heating lines. We desire five hundred plumbers and steam fitters of good repute who can furnish satisfactory references, to act as introducing agents for our specialties to the consuming trade. We pay liberal commission but only desire to do business with those whose reference is satisfactory. Address, 1817, care Domestic Engineering, 64 N. Jefferson St., Chicago t f.

Domestic Engineering

Monthly Edition

Plumbing, Heating, Lighting, Ventilating Engine, Mining and Mill Supplies.

Office of publication: 58-64 N. Jefferson st., Chicago.

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HERBERT T. SHERRIFF . . . . . Editor
RASMUS HERLOV . . . . . Assistant Editor
ELMER CRAWFORD . . . . . General Manager

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Toronto, Ontario.

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VICTOR H. ROSS.

Quebec, Quebec.

Office . . . . . 96 St. Peter Street.

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Advertising

Copy and cuts for monthly advertisements should be received by the first of the month, for weekly edition not later than Tuesdays. We cannot guarantee insertions or changes in advertisements if received later.

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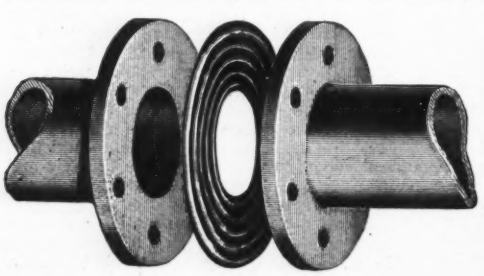
Member of the Trade Press Association.

SEPTEMBER 25, 1902



OUR PATENTED

MINERAL WOOL PIPE COVERING AND COPPER GASKETS

THEY SAVE STEAM AND MAKE ABSOLUTELY TIGHT JOINTS

BEST AND CHEAPEST SAMPLES FREE

UNITED STATES MINERAL WOOL CO.
143 Liberty Street, NEW YORK.

On July 1, 1902

THOMSON

Meter Company

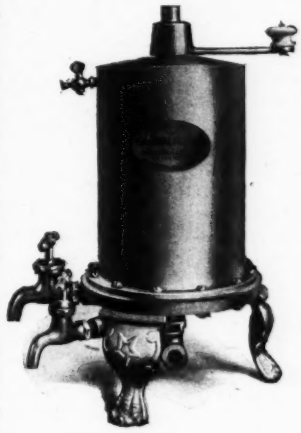
79 Washington St., Brooklyn, N. Y.,

STAMPED WATER METER

211,218

We Stamp our Meters only as they are sold.

THE NATIONAL FILTER



gets the attention of the alert dealer because it is nationally advertised in the best magazines.

Your customers know about it. They want it.

You cater to a certain demand. The National Filter

Does Remove Germs.
Does Remove all Suspended Impurities.
Does Not Remove Elements.

Since germs can't be dissolved the National Filter gets them. Since the National doesn't change water elementally, it is better than boiling.

We want a few more general agencies. We want only those who are in touch with *the best trade* or are willing to make a specialty of the best trade. We send you free, a booklet that tells all about it.

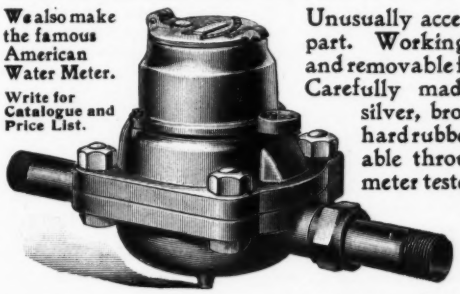
NATIONAL FILTER COMPANY

122 DEARBORN STREET, CHICAGO, ILLINOIS

The Niagara Water Meter

We also make the famous American Water Meter.

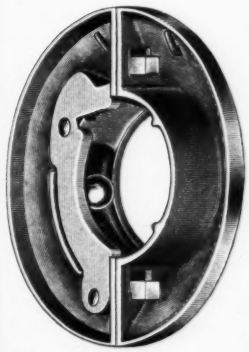
Write for Catalogue and Price List.



Unusually accessible in every part. Working parts separate and removable from outer case. Carefully made of German silver, bronze, brass and hard rubber. Interchangeable throughout. Each meter tested for accuracy and to a hydraulic pressure of 3001bs. per sq. inch.

Buffalo Meter Co., 363 Washington St., **Buffalo, N. Y.**

Ball Bearing!



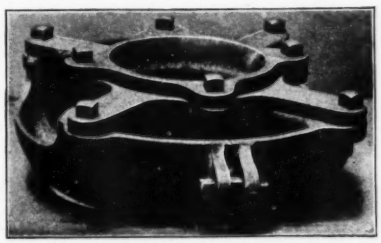
Snyder's Model Ball Bearing Ceiling and Floor Plates are absolutely the best plates in the world. No better goods made and no lower prices quoted for such standard goods. We are exclusive makers of ball bearing plates.

Send for Discounts to the Trade.

L. H. Snyder & Co.

BRISTOL, CONN.

No More Broken Joints



Replaces cement joint between iron soil pipe and earthenware sewer pipe, keeping sewer gas absolutely out. There is no "IF" about it. Ou circular free.

GEORGE F. RYAN & COMPANY

420 Wabash Ave. CHICAGO, ILLINOIS.

THE CHAMPION

HOT WATER

Combination Heaters

They Fit Any Furnace.

These Boilers are made in three sizes diameter, and from 100 to 600 square feet radiation capacity. Will heat those cold rooms, or an addition to the building. Will increase the capacity of any furnace. Are cheaper than coils and will do more work. Write for new circular.

Manufactured by

FRANK D. STOLZ, 115 Lake Street, Chicago, Ill.

PATENTS AND INVENTIONS

695,956. Boiler. Emile Solomiac, Paris, France.

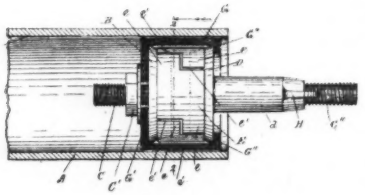
Wm. Newell & Bro., Philadelphia, are installing two of Cooper's Nautilus closets in the University of Pennsylvania.—Adv.

696,859. Acetylene gas generator. John B. Clopton, Bastrop, Tex.

698,174. Flue-Cleaner. David Boyd, Louisville, Ky.

Ridgway & Tyler, Albany, N. Y., are placing two of Cooper's closets in a fine residence in that city.—Adv.

705,059. Plumbers' testing tube. Joseph Flynn, Boston, Mass.



Newton & Gray, Philadelphia, are plumbing the Raquet Club, on Walnut street, using Cooper's goods throughout.—Adv.

698,044. Apparatus for Generating Acetylene Gas. Jean Nouzaret, Brussels, Belgium, assignor to the Compagnie Continentale d'Incandescence et de Chauffage (systeme Frank et Poitrimol).

698,102. Process of Manufacturing Incandescent Mantles. George Buhlmann, Berlin, Germany.

698,425. Acetylene-Gas Generator. Arthur Yancey, New Orleans, La., assignor to the Yancey Generator Co., New Orleans, La.

Frank J. Eustace, Philadelphia, is plumbing the residence of Thos. O'Donnell, using Cooper's goods.—Adv.

698,427. Gas-Lighter. Ernest D. Anderson, New York, N. Y.

699,081. Pumping Mechanism for Feeding Water to Steam-Boilers. Charles Crompton, Worcester, Mass.

S. H. Barrett, Auburn, N. Y., is installing Cooper's Nautilus closets in a fine residence in that city.—Adv.

698,471. Detachable Boiler-Flue. Julian F. Drake, Tracy, Minn.

698,953. Carbureter. George W. Honts, Broken Bow, Nebr., assignor of one-third to J. R. Dean, Broken Bow, Nebr.

H. Schleuning, Alleghany, Pa., is installing Cooper's Nautilus and Reno closets in an operation he has on hand.—Adv.

698,983. Tank-Heater. Matthew Lynch, Maltabend, Mo.

698,988. Ventilator for Fire-Surfaces of Ranges. Arthur E. Minns, Brooklyn, N. Y.

W. H. Yaxley & Son, Willoughby, O., is remodeling the plumbing in a residence in that city, using Cooper's Nautilus closet.—Adv.

699,016. Ventilator. Robert E. Rudolph, Paducah, Ky.

699,032. Water Supply and Filtering System. Lloyd E. Smith, Portsmouth, Ohio.

J. H. Christ, West Newton, Mass., is installing Cooper's baths in a fine residence in that city.—Adv.

699,053. Hydrocarbon-Burner. Richard Witty, San Bernardino, Cal.

699,106. Acetylene-Gas Generator. Oscar Falkenwalde, Baltimore, Md., assignor of one-half to Charles F. Stauffen, Baltimore, Md.

Hineline & Co., Minneapolis, Minn., are placing two Nautilus closets in a contract which they have on hand.—Adv.

699,136. Sectional Hot-Water Boiler. Bruno F. Behrendt, Dresden, Germany, assignor to Pflaum & Gerlach, Schoneberg, near Berlin, Germany.

699,170. Steam-Trap. James W. Hodges, Jersey City, N. J., assignor of one-half to Henry C. Voss, New York, N. Y.

699,176. Catch-Basin for Sewers. William J. Hough, Albany, N. Y.

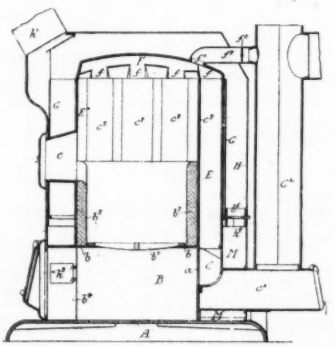
699,191. Lubricator. Oliver G. Kipp, Rochelle, Ill.,

699,245. Expansible Bolt. Edgar A. Russell, Wallingford, Conn.

699,274. Acetylene-Gas Generator. Joseph S. Wood, Sr., Brooklyn, N. Y.

699,289. Pipe and Flue Cleaner. Charles F. Craddick and George W. Farlin, Jr., Butte, Mont.

705,422. Hot-air heater. Moses B. Moore, Pennington, N. J., and George W. Leddon, Philadelphia, Pa., assignors to the Pennington Foundry and Heater Company, Pennington, N. J., a corporation of New Jersey.



Peter Adriance & Son, Poughkeepsie, N. Y., have a contract on hand in which they are using Cooper's closets.—Adv.

699,337. Acetylene-Gas Generator. Leo Montel, New York, N. Y., assignor to Acetylene Manufacturing Company, New York, N. Y., and Jersey City, N. J., a corporation of New Jersey.

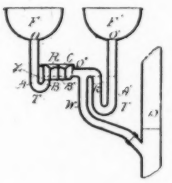
699,345. Apparatus for the Treatment of Sewage. Andrew J. Provost, Jr., Brooklyn, N. Y.

699,352. Ventilating apparatus. John Titus, Oyster Bay, and William Titus, Old Westbury, N. Y.

F. A. Wendall, Salem, Mass., is remodeling the plumbing in the house of Mr. Sanders, of Newburyport, using Cooper's Nautilus closets.—Adv.

699,656. Hose-rack. Edward Cliff, Newark, N. J., assignor to Cliff and Guibert Company, New York, N. Y., a corporation of New York.

706,255. Apparatus for protecting seals of sewer gas traps. John P. Putnam, Boston, Mass.



699,650. Gas-fixture. George F. Bryan, Chicago, Ill., assignor to Edward E. McMorran and Fred Gerlach, trustee, Chicago, Ill.

699,645. Acetylene-gas generator. William H. Bazley, Whitman, Mass.

699,857. Mantle-support for gas-burners. Helen H. Tibbs, West Seneca, N. Y., assignor to the Tibbs Mantle Support Company, Buffalo, N. Y., a corporation of New York.

Geo. F. Uber & Co., Philadelphia, are plumbing the residence of Mr. Hartman, using Cooper's closets and other plumbing fixtures.—Adv.

699,912. Hydrocarbon-lamp. Charles H. De Voll, Oakland, Cal.

699,959. Cellar and cistern drainer. William D. Labadie, South Bend, Ind., assignor of one-half to Joseph G. Duck, Milwaukee, Wis.

699,965. Carbureter. Alexis L. Mangin, Aylmer East, Canada.

699,982. Disinfecting device for sink-drains. Jacob F. Seabury and Charles Lutz, Newark, N. J.

699,704. Valve-operating mechanism for wash basins. Edgar B. Parsons, Moorhead, Iowa.

Davis & Wright, Buffalo, N. Y., are installing Cooper's Nautilus closets in a residence in that city.—Adv.

PATENTS DESIGNS

N. L. FROTHINGHAM

Counselor-at-Law Registered Patent Attorney
Ex-Assistant Commissioner of Patents

NEW YORK
271 BROADWAY

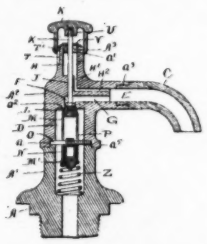
BOSTON
53 STATE ST.

699,798. Valve for automatic water-heaters. James L. Graham, Allegheny, Pa.

Albert Tomkinson, Ft. Wayne, Ind., is using four of Cooper's Nautilus closets in an operation in that city.—Adv.

669,818. Valve. James J. Rylands, Millvale, Pa., assignor to Homestead Valve Manufacturing Company, Homestead, Pa., a corporation of Pennsylvania.

706,432. Self-closing valve. Frederic H. Mason, Spokane, Wash.



McElroy-Hudspath Plumbing & Heating Co., Pueblo, are using Cooper's closets and other fixtures in some work they have on hand.—Adv.

699,665. Automatic hydraulic fire-extinguishing system. James Curry, Rockford, Ill.

699,692. Wrench. Clarence C. Longard, Halifax, Canada.

700,068. Feed-water cleaner. Donald B. Morison, Hartlepool, England.

700,080. Steam heating apparatus. Simeon G. Phillips, Rahway, N. J.

700,170. Pump. John Clancy, Soldiers Grove, Wis.

700,[illegible]. Main Valve for Fire-Extinguishing Systems. Henry Eversman, Cincinnati, Ohio.

700,927. Air-Compressor. Ebenezer Hill, South Norwalk, Conn.

700,351. Stopper for Boiler-Tubes or Hollow Shafting. Henry T. Mason, Chicago, Ill.

700,354. Handle. Wilbur N. Maynard, Leominster, Mass.

700,387. Valve-Controlling Mechanism for Automatic Water-Heaters. James Tracy and William A. Bollinger, Allegheny, Pa., assignors, by direct and mesne assignments, to the Sterling Automatic Instantaneous Water Heater Co., Allegheny, Pa., a Corporation of Pennsylvania.

700,434. Reducing-Valve. George W. Lord, Chicago, Ill.

700,403. Gas-Pressure Regulator. David L. Block, New York, N. Y., assignor of one-half to Jacob Lederer, New York, N. Y.

700,449. Feed Water Regulator. Christopher M. Spencer, Windsor, Conn.

700,475. Hydrocarbon-Lamp. Thomas H. Blair, Northboro, Mass.

700,485. Flush-Valve. James J. Finney, Chicago, Ill., assignor of one-half to Joseph H. Chandler, Chicago, Ill.

700,546. Water-Heater and Steam-Generator. Chas. Nalencse, Cranford, N. J.

700,574. Incandescent Gas-Burner. Clarence W. Taylor, Sioux City, Iowa.

H. G. Burrell, Stoughton, Mass., is remodeling the plumbing in a residence in that city, using Cooper's Nautilus closet.—Adv.

Cope Pattern Works
Detroit, Mich.
Steam and Hot Water Boilers, Radiators, etc.

700,603. Fire Extinguisher. William H. Banfil, Boston, Mass.

700,307. Carbureter. George C. Diehl and Jeremiah A. Barber, Butler Ind.

701,428. Automatic vent valve. Laurence J. Walsh, New York, N. Y., assignor of one-fourth to Michael J. Sullivan, Butte, Mont.

Holmes Bros., Philadelphia, are using a number of Cooper's closets, lavatories and baths in an operation they have on hand.—Adv.

701,433. Acetylene-gas generator. John W. Weeks, Providence, R. I., assignor to the Universal Acetylene Company, Providence, R. I., a corporation of Rhode Island.

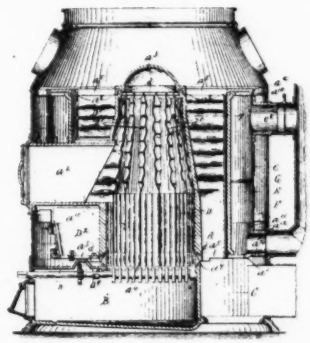
701,373. Water-filter. James W. McLean, Joplin, Mo.

701,489. Pipe wrench. William Love, Bryn Mawr, Pa.

701,509. Valve. James J. Rylands, Millvale, Pa., assignor to Homestead Valve Manufacturing Company, Homestead, Pa., a corporation of Pennsylvania.

Scoville Plumbing & Heating Co., Pueblo, Colo., have some work on hand in which Cooper's goods are being used.—Adv.

706,496. Furnace. Elziver O. Rickard, Syracuse, N. Y., assignor to the Kelsey Heating Company, Syracuse, N. Y.



Filbrick & Pope, Swampscott, Mass., are using Cooper's goods in some alteration work they have on hand.—Adv.

701,518. Feed water heater. Frank W. Shupert, Spokane, Wash.

701,524. Steam trap. Frederic Tudor, Brookline, Mass.

701,548. Flushing apparatus, Charles B. Day, East Orange, N. J.

701,590. Gas and air mixer. Gustave A. Loeben, Philadelphia, Pa.

701,569. Seed planter. Elijah F. Israel, Wichita, Kan., assignor of one-half to R. C. Israel and George W. Israel, Wichita.

Wm. A. Lowe, Portland, Me., is using Cooper's goods in some work he has under way.—Adv.

701,704. Gas purifier. Delbert O. Freeman, Binghamton, N. Y., assignor of one-half to the Rex Acetylene Generator Company, Binghamton, N. Y., a corporation of New York.

701,806. Apparatus for generating gas. William J. Faulkner, Chicago, Ill.

700,727. Apparatus for Treating Garbage. Rufus E. Boschert, Syracuse, N. Y.

701,296. Smoke consumer. David Clump and William Hofmeister, St. Louis, Mo.

James & Condon, Boston, are plumbing the residence of Mr. Lamb, using five of Cooper's Nautilus closets.—Adv.

700,819. Acetylene-Gas Generator. John Quist and James A. Bain, Cleveland, Ohio.

700,826. Water-Purifying Apparatus. James Roan, Portsmouth, Va.

700,854. Tank-Heater. Joel Strahm, Bern, Kan.

704,556. Furnace-Top Down-Comer and Explosion-Pipe. Patrick Meehan, Lowellville, Ohio. Filed Nov. 13, 1901. Serial No. 82,131. (No model.

704,623. Steam-Heating System. Harry A. R. Dietrich, South Bethlehem, Pa. Filed Apr. 16, 1901. Serial No. 56,118. (No model.)

704,889. Heating-Stove. Charles Matthews, Columbia, Mo. Filed Apr. 14, 1902. Serial No. 102,743. (No model.)

704,945. Acetylene-Gas Generator. Carl W. Soderberg, Nordstrand, near Christiania, Norway. Filed July 11, 1899. Serial No. 723,499. (No model.)

E. E. Scott, Saginaw, Mich., is installing Cooper's closets in an operation he has on hand.—Adv.

704,967. Acetylene-Gas Generator. Fred L. Kincaid, Stockton, Cal., assignor to Pacific Acetylene Gas Company, San Francisco, Cal., a corporation of California. Filed Nov. 2, 1898. Renewed Mar. 3, 1902. Serial No. 96,577. (No model.)

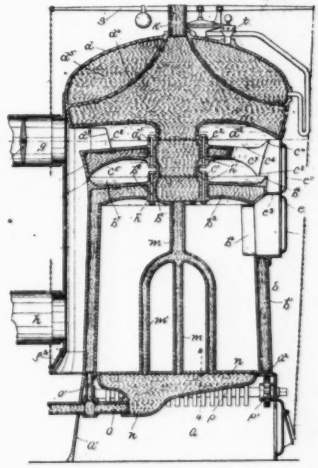
704,988. Heater. Wesley E. Vanstone, New Westminster, Canada. Filed Sept. 25, 1901. Serial No. 76,572. (No model.)

702,903. Proportionate-distribution valve system for pumps. Arthur Abendroth, Berlin, Germany. Filed Dec. 18, 1901. Serial No. 86,379. (No model.)

702,919. Pipe cutter and wrench. Adam S. Boyd and George Yearnell, Shenandoah, Pa.

702,970. Disk water-meter. Wm. H. Larrabee, Worcester, Mass., assignor to Union Water Meter Company, Worcester, Mass., a Corporation of Massachusetts.

706,846. Steam-Generator or Hot-Water Heater. William H. Page, Norwich, Conn., assignor to the Page Company, Plainfield, Conn.



W. J. McGuire & Co., Toronto, Ont., are installing Cooper's Nautilus closets in a residence in that city.—Adv.

702,041. Apparatus for disinfecting. Charles J. Walz, New York, N. Y., assignor to West Disinfecting Company, New York, N. Y., a corporation of New York.

702,079. Pipe-wrench. George H. Swarthout, Placerville, Cal., assignor of one-half to Marcellus L. Smith, Placerville, Cal.

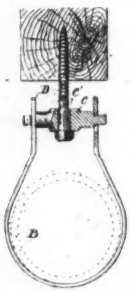
702,092. Acetylene-gas apparatus. Arthur W. Edwards, Sacramento, Cal.

702,225. Disc water-meter. William H. Larrabee, Worcester, Mass., assignor to Union Water Meter Company, Worcester, Mass., a corporation of Massachusetts.

705,319. Water-closet bowl. Hiram T. Bush, Detroit, Mich.

705,981. Low-pressure Steam-Heater. Frederic Tudor, Brookline, Mass.

706,903. Pipe-Hanger. James Crawford, Boston, Mass.

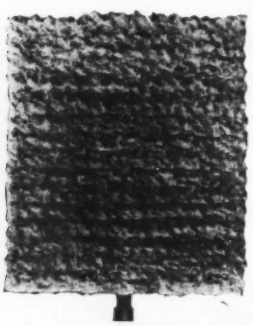


C. F. Lynch, Lawrence, Mass., has a contract for an apartment house in which he is using Cooper's closets, baths, lavatories and other plumbing fixtures.—Adv.

702,236. Gas regulator. Sylvester L. McAdams, Beaver Falls, Pa.

706,566. Urinal. Heman D. Janes, Saginaw, Mich. Filed May 11, 1901. Serial No. 59,739. (No model.)

"Eclipse" Asbestos Burner



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Full Face Surface Burner for Artificial or Natural Gas.

After four years use in our city we have decided to place our ECLIPSE BURNER before the public believing that we manufacture the best burner on the market We have in use in Toledo over 2000 of these burners, and have yet to find a dissatisfied customer.

We manufacture the best that can be made, using special hard pressed asbestos board that will not burn out under 4 to 6 years, galvanized iron back that will not rust. Any size made to order. We furnish the burner complete with mixer and full instructions to set, to get the best results,

Should you feel interested ask for List and Discounts and order sample.

Test & Wright

1505 Adams St., Toledo, Ohio

706,686. Incandescent Gas-Burner. Edward W. Phelps, Montreal, Canada, assignor of one-half to Theodore Nadeau, Montreal, Canada.

706,573. Cock or Faucet. Robert F. Lindsay, Greenville, S. C., assignor to Samuel C. Koonce, Clarksville, Pa., and John S. Leslie, Sharon, Pa.

706,613. Steam-Valve. Henry W. Waite, Wollaston, Mass., assignor of one-half to William H. Cox, Wollaston, Mass.

706,782. Feed-Water Heater and Purifier. Harry J. Reynolds, Cleveland, Ohio, assignor of one-half to Ernest T. Laundon, Cleveland, Ohio.

706,791. Seat for Water-Closets. William C. Anderson, Detroit, Mich.

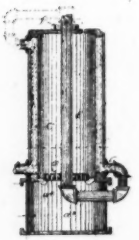
706,983. Overflow Attachment for Bath-Tubs or the like. Hugh Merrie and Alfred E. Burnett, Jr., Cincinnati, Ohio.

707,077. Acetylene-Gas Generator. David W. Bishop, Lenox, Mass.

707,111. Compressed-Air Heating Apparatus. George W. Hopkins, Cleveland, O., assignor to the Terry Heater Company, Cincinnati, O., a corporation.

707,119. Hydrant-Cock. Josiah H. Kidder, Pueblo, Col.

707,349. Water-Heater. Thomas L. Phillips, Aurora, Ill.



F. A. Wendall Plumbing & Heating Co., Watertown, Mass., are placing Cooper's Nautilus closets, baths, etc., in an operation they have on hand.—Adv.

707,146. Gas-Producer. Leonard L. Merrifield, Toronto, Canada, assignor to Edwin James Checkley, trustee, and Economical Gas Apparatus Construction Company, Limited, Toronto, Canada.

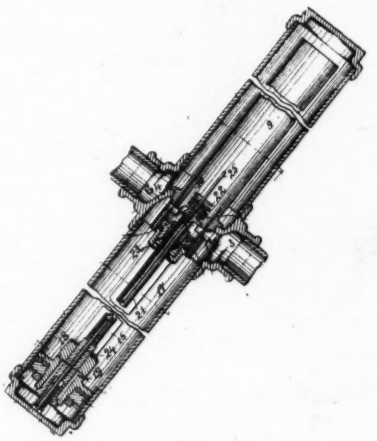
707,177. Hydrocarbon Lamp. George R. Stillman, Philadelphia, Pa.

707,185. Incandescent Gas-Lamp. Gustav Tresenreuter, Berlin, Germany.

707,203. Boiler or Water-Heater. David M. Burns and Alexander B. Burns, Green Bay, Wis.

707,285. Burner. Milo S. Walker, Chicago, Ill., assignor of two-thirds to Max Herskovitz and Abraham L .Herskovitz, Chicago, Ill.

707,395. Automatic Valve. Nelson Curtis, Boston, Mass., assignor to the Sumner & Goodwin Company, Boston, Mass., a corporation of Massachusetts.



The Iowa Htg. & Plumb. Co., Des Moines, Iowa, are plumbing the residence of Mr. Geo. E. King, using three of Cooper's closets.—Adv.

707,216. Steam-Boiler. Henry A. Duc, Jr., Charleston, S. C.

706,869. Mechanism for temporarily locking Water-Closet Bowls or Washbasins. Edward Woodruff, Chicago, Ill.

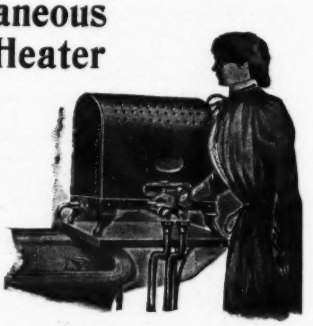
706,928. Valve for Gas-Fixtures. Michael J. Graham, Chicago, Ill., assignor to William G. King, Chicago, Ill.

706,886. Domestic Boiler. Joseph A. Bernardi, Salem, Ore.

707,485. Safety-Valve. William Wishart and Bruno Seidel, Chicago, Ill., assignors to the Adams & Westlake Company, a corporation of Illinois.

The Victor Instantaneous Water Heater

is the cheapest, the most efficient and the neatest water heater made. It occupies but little space and is always ready, furnishing hot water in a few seconds, day or night.



The Victor received the highest award at the Omaha Exposition in 1898.
Write for descriptive circular, prices, discounts, etc.

W. J. ADAM....JOLIET, ILL.

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For particulars write the Superintendent.

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Akron Gas Valve Co.....xxiv
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American Radiator Co....i & ii
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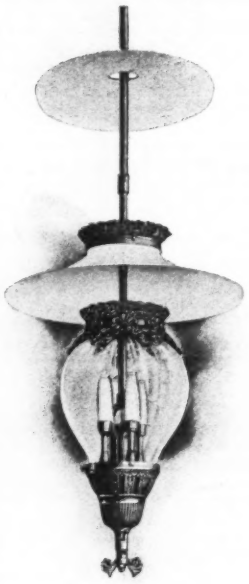

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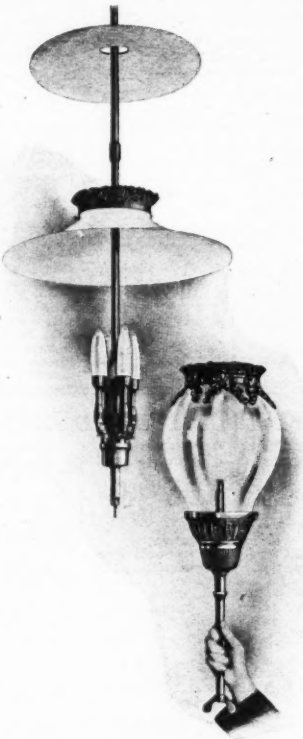

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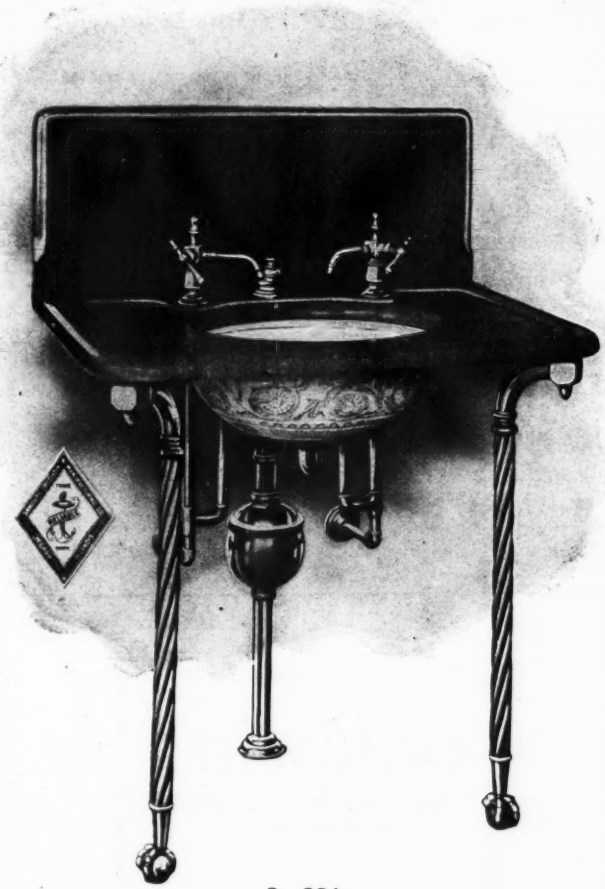

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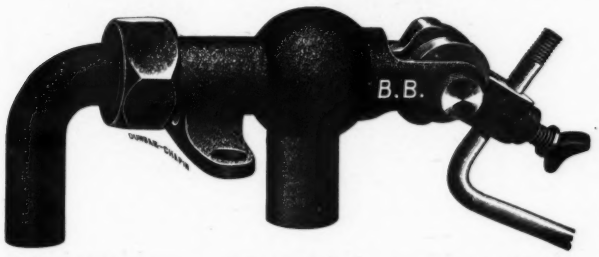

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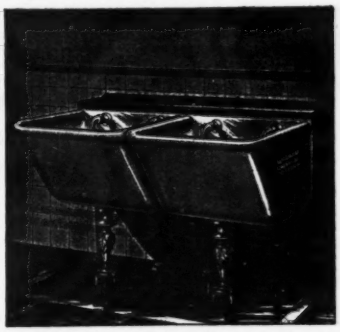

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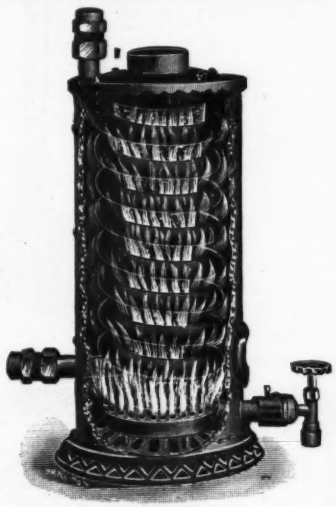

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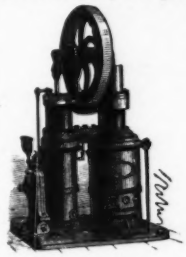

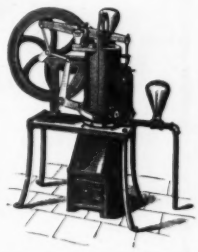

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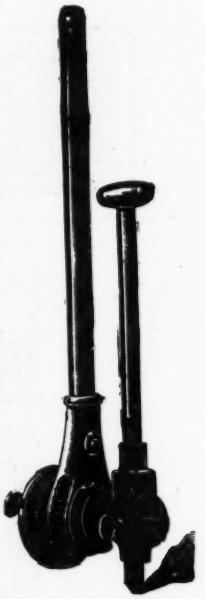

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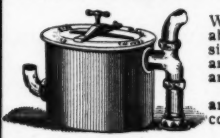

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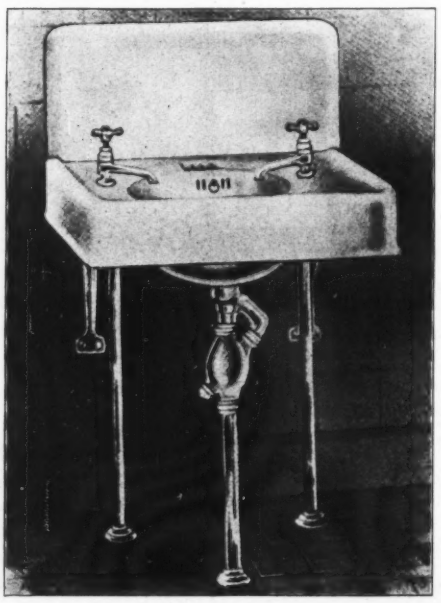

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Sizes 2 to 6 inches.
Light and Heavy.
Makes a neat job and saves your patience.
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Always ready for instant use. It has a *Patent Force and Lift Cup* which will cover a 4 inch opening. It has a *Patent Adjustable Washer* from ¾ to 2 inches.

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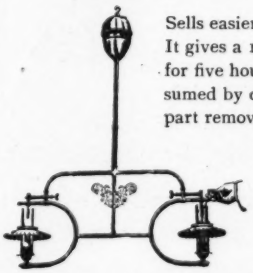

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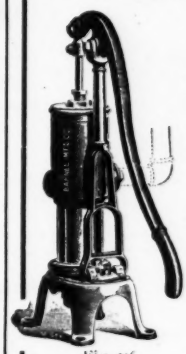

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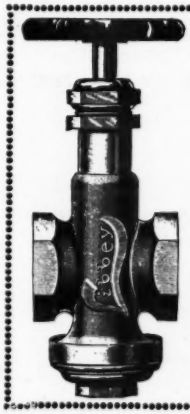

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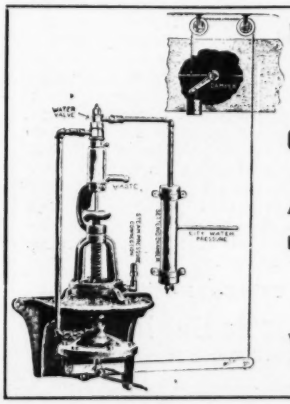

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Invaluable to Plumbers—Saves Ten Times Its Cost Every Month. Send for Prices.

This device is a **Specially Shaped Spiral Spring** made from **Crucible Steel** wound tapering to one end so as to be easily withdrawn, and having a loop at the other to hook into when the bend is to be made in a long piece of pipe. The Bender placed inside of the pipe, supports and prevents the pipe from flattening or collapsing while being bent. By the use of it lead pipe, and copper, brass or steel seamless tubing may be quickly and easily bent. It is as easy to form opposite or double curves, such as goose necks, as a single bend.

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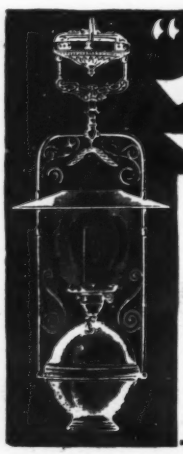

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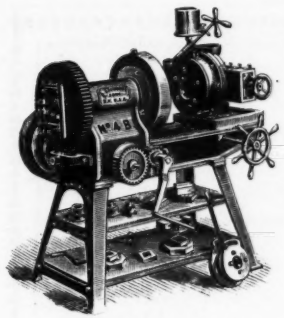

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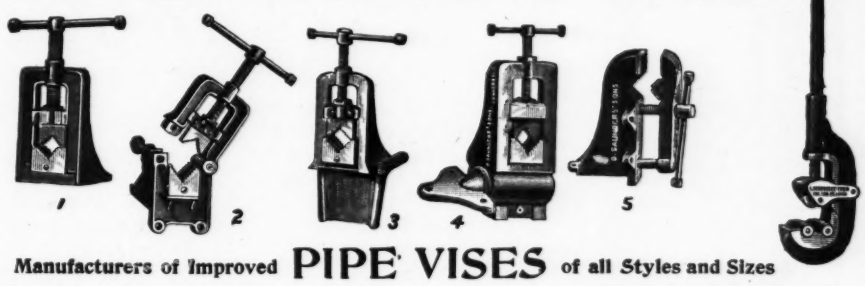

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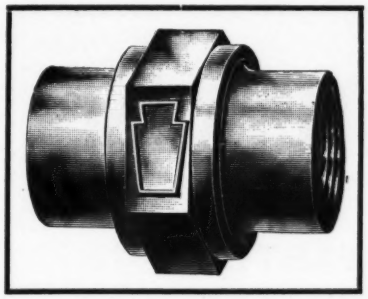

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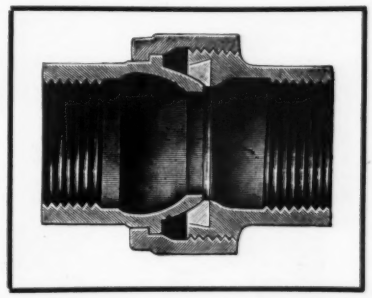

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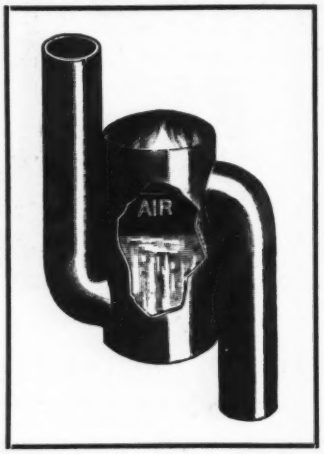

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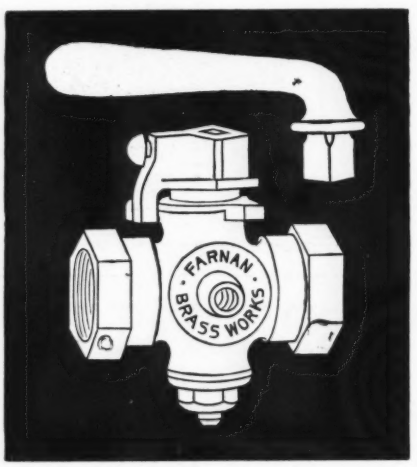

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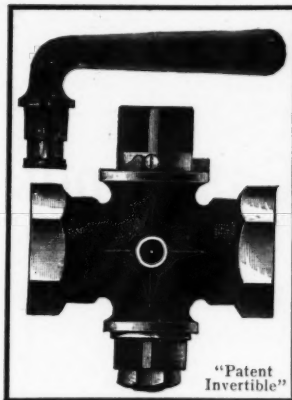
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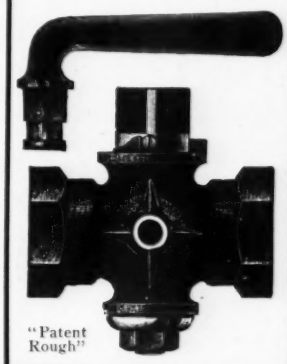
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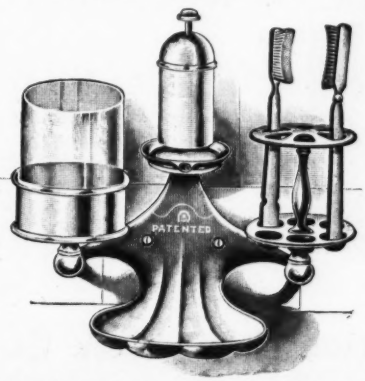

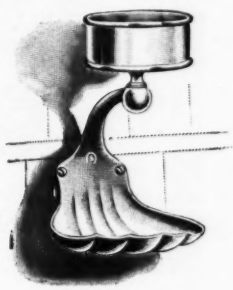
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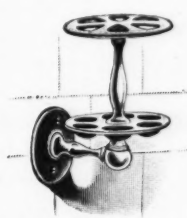
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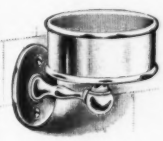
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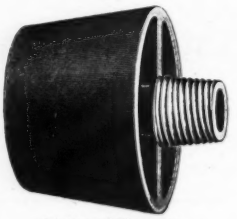

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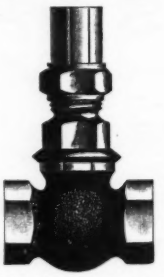

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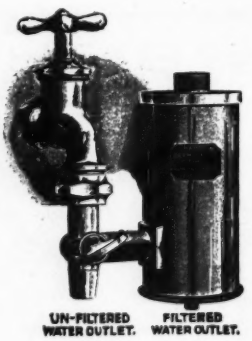

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DALE

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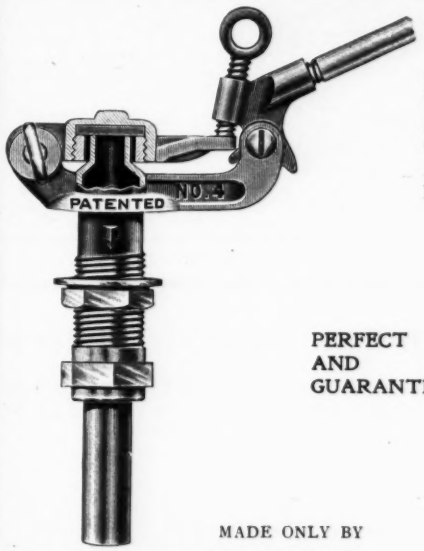

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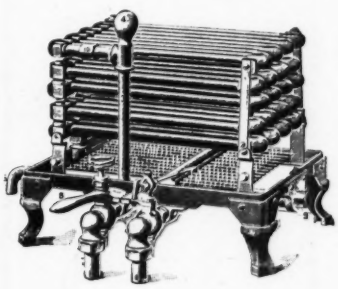


The "Victor"

Instantaneous Water Heater

W. B. Folger's Patent, Aug. 20th, 1901

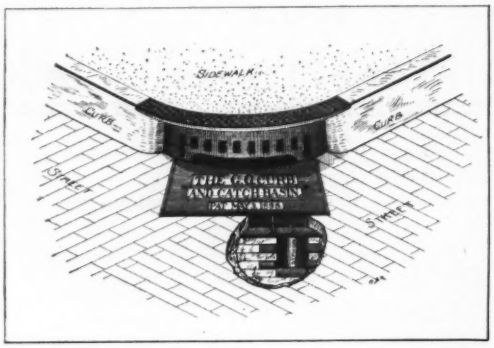
This Heater has stood the test of seven years' use under all possible conditions—Uses gas as a fuel and heats water in ten seconds—Send for descriptive circular.

IMPORTANT NOTICE!

The license heretofore granted W. J. Adam, Joliet, Illinois, to make and sell the "Victor" Heater, has been cancelled, for non-compliance with contract, and for making and selling, under the name of "Victor", a differently constructed and inferior article. The said Adam was the only licensee, and W. B. Folger is now the exclusive owner and manufacturer of the "Heater". Notice is hereby given that infringements of either trade mark or patent, will be promptly and vigorously prosecuted.

W. B. FOLGER, Patentee,

320 WEST FOURTH STREET CINCINNATI, OHIO



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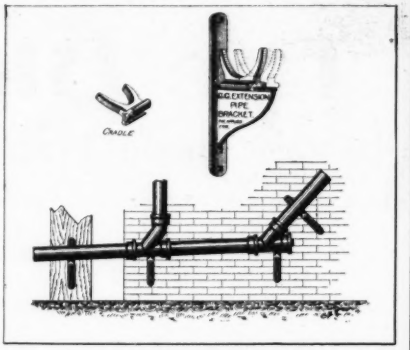

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We call it Double Jet because the Burner is constructed with two separate and distinct Jets; an AIR JET and a GAS JET, which are independently controlled and operated. These two jets enter the Combustion chamber separately and are united into one intensely hot pointed flame.

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No. 6455.

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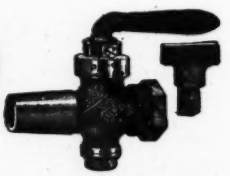

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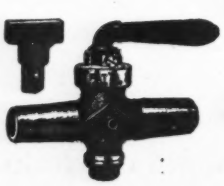

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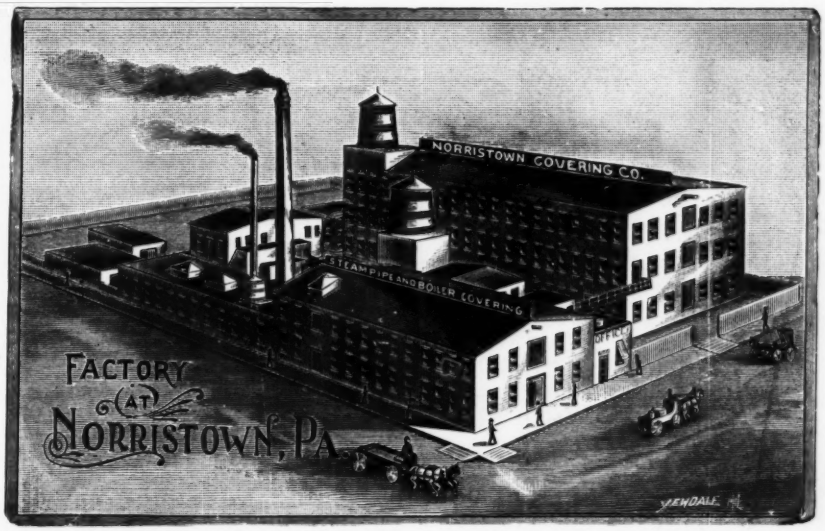

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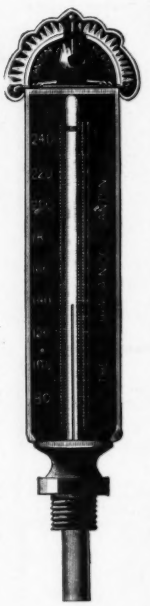

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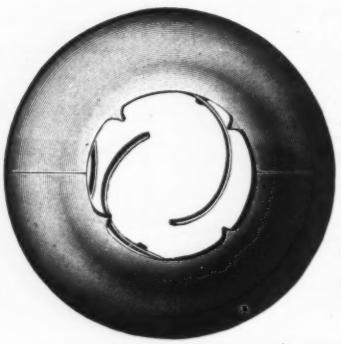

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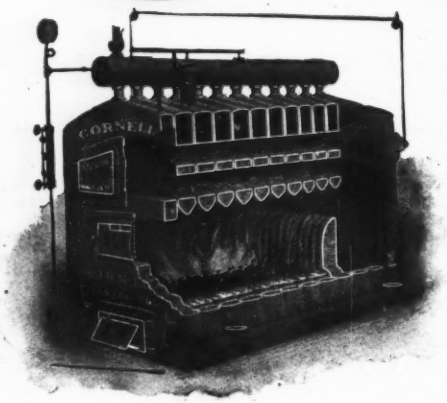

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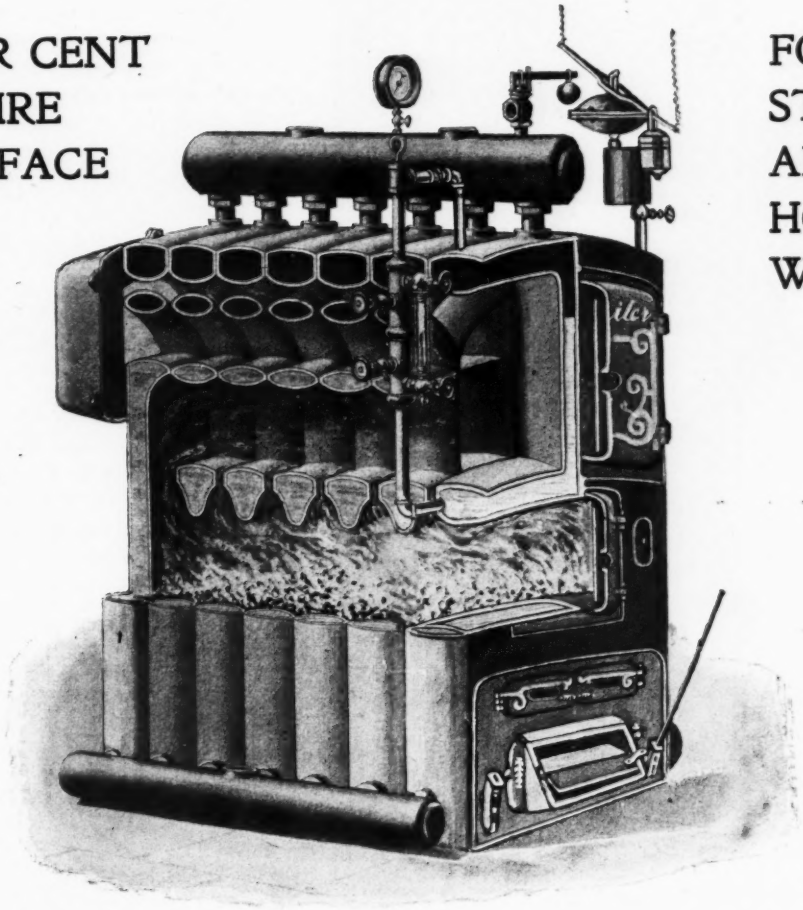

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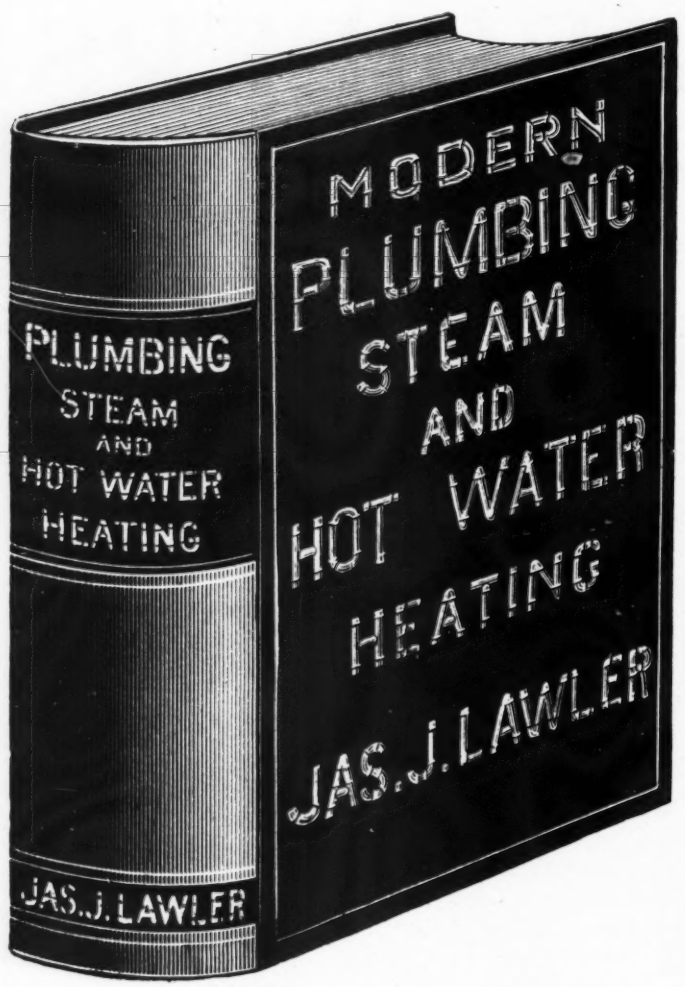

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Will not craze under frosts.
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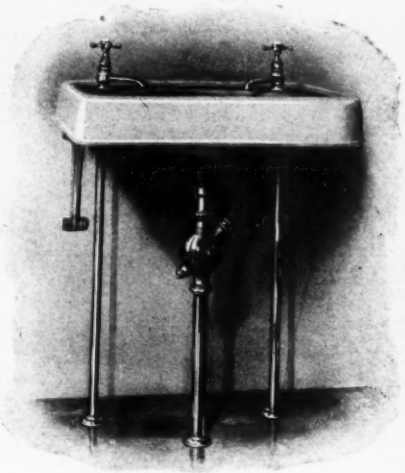
A Lavatory without joints or cracks will recommend itself at once, as more desirable than the old pattern having the Slab, Bowl and Back in separate pieces as the absence of crevices that would afford a lodgment for dirt allows it to be more easily kept in a sanitary condition.



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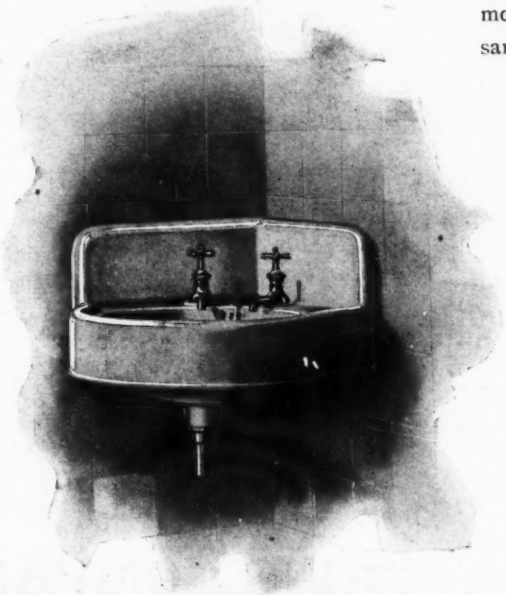

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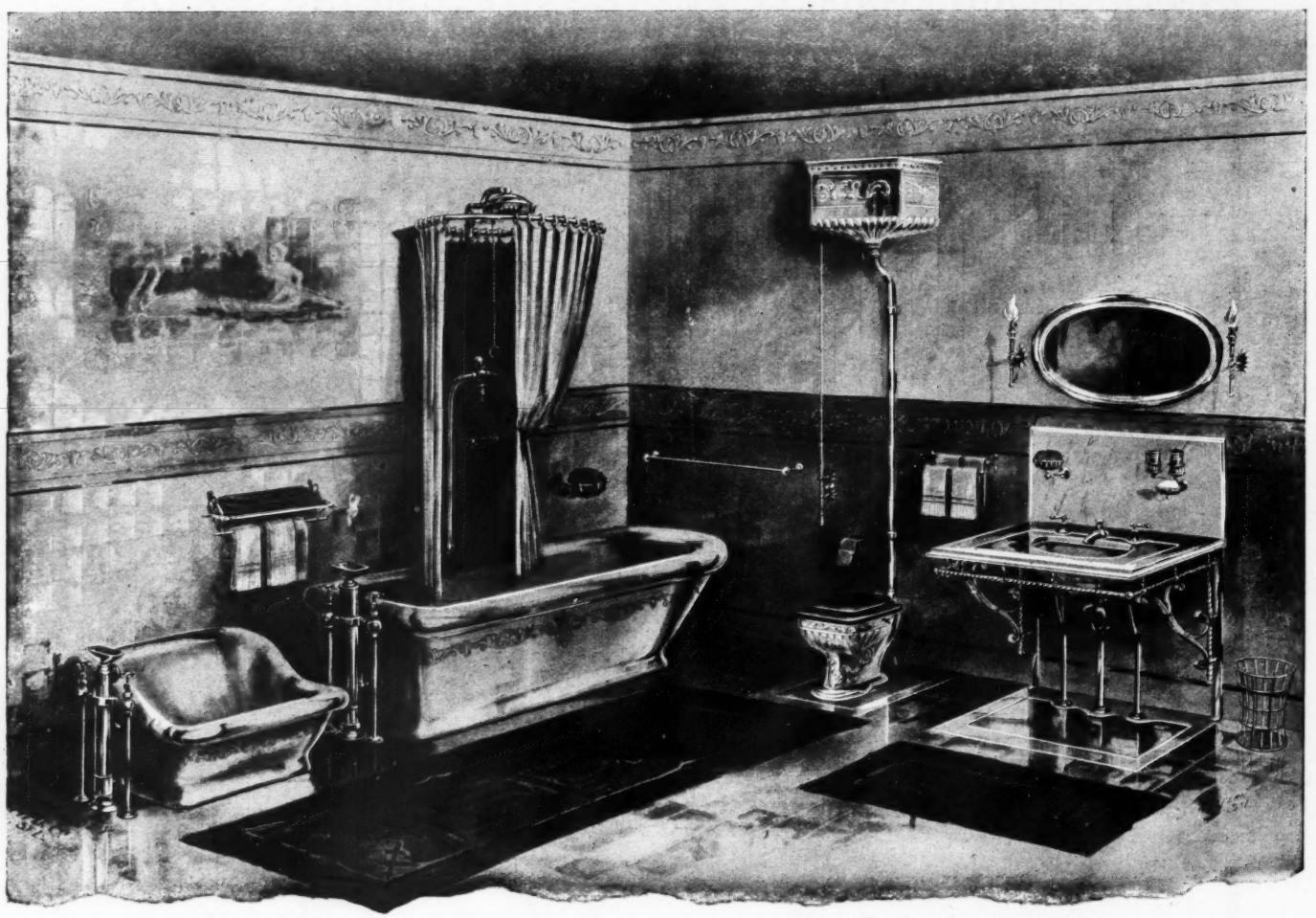
RUMSEY'S "UNA-SEAL"

BATH ROOM COMBINATION, COMPRISING



BATH.—"Una-Seal" Solid Porcelain Roll Rim Bath Tub, 5½ feet long, Class "A," with Porcelain Base to the floor, glazed inside and over Rim, exterior finished Zinc White with "Una-Seal" Decoration, Nickel-plated Low Bell Supply Fitting with Supply Pipes and "Superior" Waste, Nickel-Plated Combination Needle and Shower Bath with Rubber Lined White Curtain.

WATER CLOSET.—Square Embossed "Una-Seal" Syphon Jet Closet (Vitreous Ware) with Mahogany Seat and Cover, No. 25 Embossed Porcelain Syphon Tank, Nickel-Plated Flush and Supply Pipes, Nickel-Plated Rod and Pull Guide and Porcelain Pull. Decoration on Closet and Tank.

LAVATORY.—Italian Marble Lavatory, 34x24 inches with 16-inch Back, 14x19 D-shape Basin, Nickel-Plated "Olympian" Combination Supply and Waste Fixture, Nickel-Plated Supply Pipes, Trap and Ornamental Bracket, Nickel-Plated Soap, Tumbler, Brush and Sponge Holders, and 22x32-inch Plate Glass Mirror with Nickel-Plated Brass Frame.

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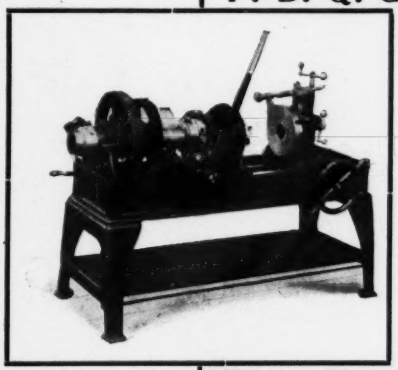
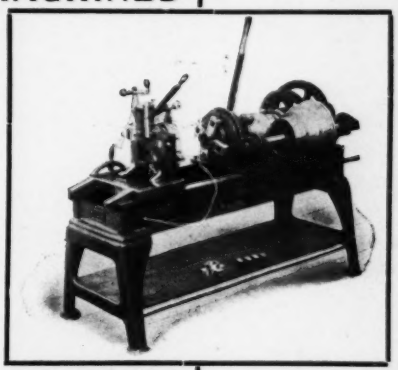


NIPPLE HOLDERS

The nipple holders are made from crucible steel drop forgings. Each set consists of four pieces. These four pieces are held in the gripping levers—taking the place of the regular pipe jaws. The cut on the right shows a set in the chuck also on the shelf.

When the chuck is open the holder expands and the nipple will fall out—a new one can be inserted and the holders closed, WITHOUT SCREWING IT INTO THE HOLDER. Both operations are performed WHILE THE MACHINE IS RUNNING. A separate set of holders is used for each size of pipe.

Further information will be gladly given. Send for a circular with larger cuts.



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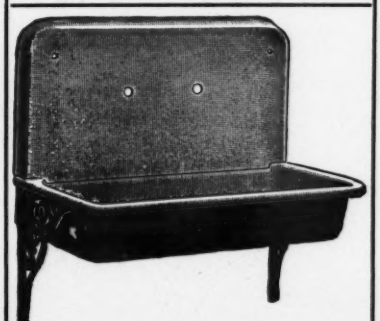

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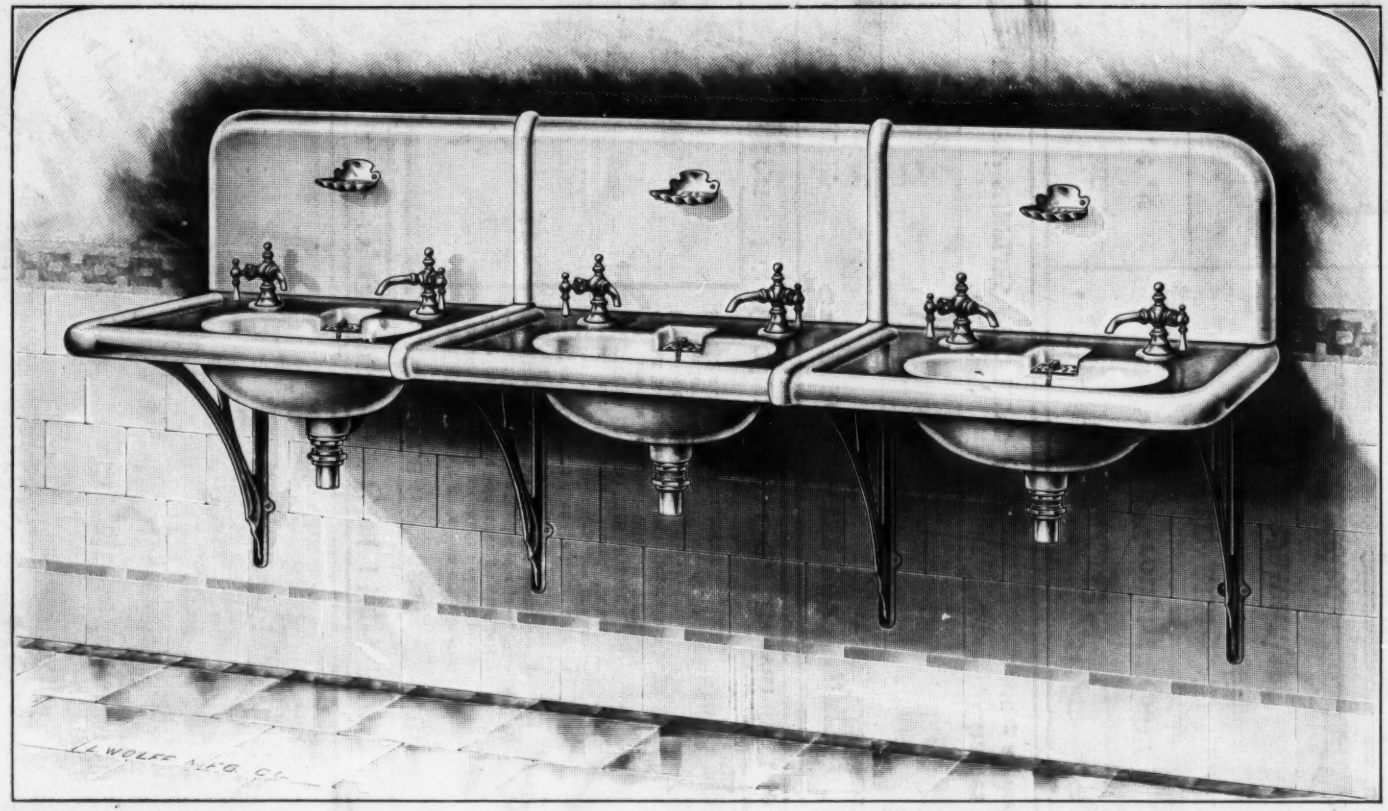

The above illustration shows the latest addition to our line of Enameled Iron Sectional Lavatories. Each section is 18 x 24 inches in size, having a straight back, D shape bowl, with extra large overflow fitted with N. P. brass strainer bolted to same. The roll rim on this Lavatory is extra large in size and curves under, giving same a very handsome effect. All joints are fitted with large lap where sections are joined together. The back is made with lower edge overlapping the back flange of slab, preventing any chance of water leaking through. N. P. Soap Cups are bolted to backs. Can be furnished with Right or Left hand end backs if so desired and also furnished with legs instead of brackets. We manufacture a complete line of Enameled Iron Lavatories of which samples are on exhibit at our Show Rooms, 91 Dearborn Street, Chicago.

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